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Social Security's Treatment of Postwar Americans
How Bad Can It Get?

Jagadeesh Gokhale and Laurence J. Kotlikoff

6.1 Introduction

As currently legislated, the U.S. Social Security system represents a bad deal for postwar Americans. Of every dollar postwar Americans have earned or will earn over their lifetimes, over five cents will be lost to the Old-Age and Survivor Insurance System (OASI) in the form of payroll taxes paid in excess of benefits received. OASI's 5 percent lifetime net tax rate can also be described in terms of the internal rate of return it delivers to contributors. This rate—1.86 percent—is less than half the rate currently being paid on inflation-indexed long-term government bonds, which are much safer. Of course, Social Security is an insurance as well as a net tax system. However, if it is viewed as an insurance company, it is clear that the insurance OASI sells (or, rather, forces households to buy) is no bargain. The load charged averages sixty-six cents per dollar of premium.

The bad deal that Social Security offers postwar Americans is, of course, payback for the great deal it offered and still offers prewar Ameri-

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cans.[1] These generations were enrolled during the beginning of Social Security and received very generous benefits compared with their tax contributions to the system. That postwar Americans are receiving less than a market rate of return on their contributions is not news. What is news is the precise degree to which postwar Americans are being hurt by the system. Understanding their treatment necessitates an actuarial approach because Social Security's benefit payout depends on the vagaries of longevity, fertility, marital arrangements, and lifetime earnings. Capturing the full range of these outcomes requires longitudinal data that follow individuals from their initial encounters with the OASI system through the end of their lives. Coronado, Fullerton, and Glass (1999, as well as their chapter 5 in this volume), Liebman, and Feldstein-Liebman (chapters 1 and 7, respectively, in this volume) use past longitudinal data for individuals or cohorts and then project future data for their observations. Our study takes a different approach, namely simulating complete lifetime histories for individuals. The data used here are from CORSIM, an extensive microsimulation model developed by Steven Caldwell and his colleagues at Cornell University (see Caldwell 1996; Caldwell and Morrison 1999).

Caldwell et al. (1999) married CORSIM's simulated data to a highly detailed Social Security benefit estimator developed by Economic Security Planning, Inc., as part of its financial planning software package, ESPlanner. The resulting study, which produced a range of findings, including those mentioned above, adopted one major counterfactual assumption—that Social Security would be able to deliver on its benefit promises without raising its rate of taxation. Unfortunately, this assumption is far from the reality. Instead, Social Security faces a staggering long-term funding problem. According to the system's own actuaries, meeting promised benefit payments on an ongoing basis requires raising the OASDI 10.8 tax rate immediately and permanently by two-fifths!

This paper uses the machinery developed in Caldwell et al. (1999) to study how bad Social Security's treatment of postwar Americans would be if Social Security maintains its pay-as-you-go (PAYGO) structure, but either raises payroll taxes or cuts benefits to bring the system's finances into present value balance. The alternatives include immediate tax increases, elimination of the ceiling on taxable payroll, immediate and sustained benefit cuts, an increase in the system's normal retirement ages beyond those currently legislated, a switch from wage to price indexing in calculating benefits, and a limit on the price indexation of benefits. The choice among these and other alternatives has important consequences in determining which postwar generations and which members of those generations pay for the system's long-term funding shortfall.

1. Saying that prewar Americans received a good deal from Social Security and that postwar Americans are, as a result, receiving a bad deal is a positive, not a normative statement. Some may view this outcome as generationally just, while others view it as exploitive.

The paper proceeds in section 6.2 with a brief literature review. Section 6.3 describes CORSIM and ESPlanner's Social Security Benefit Estimator.[2] Section 6.4 reviews the findings of Caldwell et al. (1999). Section 6.5 describes ten alternative tax increases and benefit reductions that would improve the system's present value finances and proceeds to show the distribution of the additional burden that these policies impose both across postwar cohorts and across different demographic groups within each postwar cohort. This section also reports the contribution that each policy option makes to shoring up the system's finances. Section 6.6 summarizes the main points of the chapter and concludes.

6.2 Some Relevant Literature

A number of past studies have examined Social Security's treatment of its participants by focusing on stylized cases—particular types of married couples and single individuals who differ by age of birth, sex, race, and lifetime earnings and who all live for the same number of years. These studies include Nichols and Schreitmueller (1978), Myers and Schobel (1993), Hurd and Shoven (1985), Boskin, Kotlikoff, Puffert, and Shoven (1987), Steuerle and Bakija (1994), and Diamond and Gruber (1997).

Steuerle and Bakija's 1994 study is fairly representative of the past literature and may be the best-known prior study. It considers three alternative lifetime wage patterns: low, average, and high, where "low" refers to 45 percent of the average value of Social Security–covered earnings, "average" refers to the average value of Social Security–covered earnings, and "high" refers to the value of the maximum taxable level of Social Security–covered earnings. For each cohort reaching age sixty-five between the years 1940 and 2050, Steuerle and Bakija calculate the lifetime net benefits from Social Security for singles and married couples for alternative sets of these three lifetime wage patterns. For example, they consider married couples in which both spouses have low earnings, one spouse has low earnings and the other average earnings, and one spouse has average earnings and the other high earnings. Steuerle and Bakija use their assumed earnings trajectories to compute retirement, dependent, and survivor benefits. In the case of survivor benefits, the authors consider all possible truncations of the earnings trajectories resulting from all possible alternative dates of early death, although not from any other sources. Each of the various state-contingent benefits is actuarially discounted to form a lifetime net benefit.

Steuerle and Bakija's 1994 findings generally accord with those of previous studies: They show that today's and tomorrow's workers will fare much worse under Social Security than current and past retirees; that men are being disadvantaged relative to women; and that single individuals and

2. This section draws heavily on Caldwell et al.'s (1999) description of CORSIM and ESPLanner's benefit calculator.

two-earner couples face higher net taxes than do single-earner couples. The authors also claim that "for most of Social Security's history, the system has been regressive within generations. That is, within a given cohort of retirees, net transfers have been inversely related to need: people with the highest lifetime incomes have tended to receive the largest absolute transfers above and beyond what they contributed."[3]

Like our paper, the 1999 study by Coronado, Fullerton, and Glass represents a different approach—namely, considering the dispersion of all potential outcomes. However, unlike in our paper, Coronado, Fullerton, and Glass examine actual data (from the Panel Study of Income Dynamics), rather than synthetic data. Their paper represents a real step forward in determining exactly how postwar Americans are being treated. Although their focus is on postretirement benefits and they do not include as much detail in their calculation of OASI benefits, their findings are broadly consistent with those presented here and in Caldwell et al. (1999).

6.3 CORSIM and ESPlanner's Social Security Benefit Calculator

As mentioned, we use two tools in our analysis—CORSIM, a dynamic microsimulation model, and ESPlanner's Social Security benefit calculator—to calculate OASI lifetime net taxes (taxes paid less benefits received) for baby boomers and their children.

6.3.1 CORSIM

CORSIM begins in 1960 with the representative sample of Americans surveyed in the 1960 U.S. Census Public-Use Microdata Sample. This data set is a one-in-one-thousand sample, which means that one of every thousand Americans alive in 1960 is included. The census survey provides much, but not all, of the information needed as baseline data. The remaining information is imputed to the 1960 sample from a variety of sources. CORSIM "grows" the 1960 sample demographically and economically in one-year intervals through the year 2100. Demographic growth refers to

3. Steuerle and Bakija's study pays careful attention to detail and provides an impressive and extensive array of calculations. However, it raises five concerns. First, in considering only uninterrupted earnings histories, the study omits a potentially very important source of intra- and intergenerational heterogeneity in lifetime Social Security net benefits. Second, in assuming fixed lifetime marital status, the study ignores the role of divorce and remarriage in altering Social Security net benefits. Third, in assuming that receipt of Social Security retirement benefits starts at workers' ages of normal retirement, the study ignores benefit reductions for age, delayed retirement credits, benefit recomputation, and the earnings test—all of which can materially affect Social Security's lifetime net benefits. Fourth, the study uses an extremely low real interest rate, just 2 percent, in discounting future net benefits. Fifth, in failing to consider workers who earn above the taxable maximum, the study fails to capture an important regressive element of the system—the fact that for very high-income single individuals and couples, Social Security's net lifetime taxation is a smaller fraction of lifetime earnings than it is for Steuerle and Bakija's "high" earners.

birth, death, and immigration, entry into the marriage market, family formation, family dissolution, and the attainment of schooling. Economic growth refers to working or not working, choosing annual weeks worked, and determining weekly labor earnings.[4]

As detailed in Caldwell et al. (1996), these and other CORSIM processes are determined by over 1,000 distinct equations, hundreds of rule-based algorithms, and over 5,000 parameters. Data used to estimate and test the separate equation-based modules were drawn from large national Microdata files, including High School and Beyond (HSB), the National Longitudinal Survey (NLS), the National Longitudinal Survey of Youth (NLS-Y), the Panel Study of Income Dynamics (PSID), the National Longitudinal Mortality Study (NLMS), the Survey of Consumer Finances (SCF), and the U.S. Census Public Use Microdata Sample (PUMS). Data used to construct the rule-based modules and to compute alignment factors are drawn from another six files plus miscellaneous sources.

CORSIM's alignment procedures ensure that the model's modules, which are, in part, deterministic and, in part, stochastic, are benchmarked, on a year-by-year basis, to historical and projected future aggregates. These aggregates are typically group specific, such as the average earnings of white females ages nineteen to twenty-five who are married with children in the home and working part time. Benchmarking is performed by calculating group-specific alignment factors, which are applied within each group to the values of the sample member's predicted continuous variable (such as earnings) and probabilities (such as the chance of divorcing). These adjustment factors are then used in a second pass of the model through the population.[5]

Our CORSIM data were produced by running CORSIM from 1960 through 2100. From this master sample, we selected (a) all never-married males and females born between 1945 and 2000 who lived to at least age fifteen, (b) all males born between 1945 and 2000 who married women born between 1945 and 2010 and lived to at least age fifteen, and (c) all females born between 1945 and 2000 who married males born between 1945 and 2000, all of whom lived to at least age fifteen. Selecting the sample in this manner omits (a) males born between 1945 and 2000 who married females born either before 1945 or after 2010 and (b) females born between 1945 and 2000 who married males born either before 1945 or after 2000. Thus, at the early end of the sample we lose some males who married

4. CORSIM's other economic processes include consumption expenditures; saving; federal, state, and local income and property taxation; individual asset holdings; inheritance; and disability.

5. For example, if the model generates fewer (more) than the expected number of births in a given period, the fertility probabilities for women of childbearing age in the period are scaled upward (downward). One can scale continuous variables in a simple linear fashion or by using more complex nonlinear methods.

older women and some women who married older men. At the late end of the sample we lose some males who married very much younger women and some females who married younger men.

Whatever bias this selection process introduces should be absent for cohorts born in the central years of our sample. For these cohorts, we are presumably omitting very few, if any, observations. Take, for example, those born in 1965. The males born in 1965 who are left out of the sample are those who either married women twenty or more years older than themselves or married women forty-five or more years younger than themselves. Those females born in 1965 who are omitted from the sample either married males twenty or more years older than themselves or married males thirty-five or more years younger than themselves.

Sample Size

Table 6.1 decomposes the number of observations by birth cohort, lifetime earnings quintile, sex, race, and education. The total number of sample observations in 68,688 individuals. The observations are almost equally divided among men and women. They are also fairly evenly distributed across our eleven cohorts defined over five years of birth (six years for the youngest cohort). For convenience, we refer in the text to each of the cohorts by their oldest members' year of birth. Thus cohort 45 refers to those born between 1945 and 1949, cohort 50 refers to those born between 1950 and 1954, and so on up through cohort 90, which refers to six, rather than five, separate birth cohorts, specifically, those born in the years 1995 through 2000.

Sixteen percent of the observations are nonwhite, and 41 percent have one or more years of college education. These percentages increase for successive cohorts. Eleven percent of cohort 45 is nonwhite, compared with 21 percent of cohort 95. Thirty-one percent of cohort 45 observations have at least one year of college education, compared with 46 percent of observations in cohort 95.

The table sorts observations into three lifetime earnings quintiles: the lowest 20 percent of lifetime earners, the middle 20 percent of lifetime earners, and the top 20 percent of lifetime earners. "Lifetime earnings" is defined as the present value of an individual's annual earnings from age eighteen through the end of his or her life discounted at a 5 percent real interest rate. The lifetime earnings quintiles are defined with respect to the overall distribution of lifetime earnings. *This quintile definition holds even when we consider results for specific demographic groups.* Thus, when we refer to the non–college educated in the highest quintile of the lifetime earnings distribution, we do not mean the 20 percent highest earners among those without a college education, but rather those of the non–college educated who end up among the top 20 percent of *all* lifetime earners. As one would expect (and as table 6.1 shows), 29 percent of all female

Table 6.1 **Number of Observations by Present Value of Earnings Quintiles**

Birth Cohort	Lowest	Middle	Highest	All	Lowest	Middle	Highest	All	Lowest	Middle	Highest	All
	All				White				Nonwhite			
1945–49	1,000	1,000	1,001	5,001	912	875	923	4,448	88	125	78	553
1950–54	1,209	1,209	1,209	6,045	1,090	1,031	1,076	5,279	119	178	133	766
1955–59	1,415	1,415	1,416	7,076	1,254	1,217	1,286	6,208	161	198	130	868
1960–64	1,273	1,273	1,274	6,366	1,110	1,103	1,124	5,507	163	170	150	859
1965–69	1,171	1,171	1,173	5,857	1,015	958	1,028	4,980	156	213	145	877
1970–74	1,121	1,121	1,121	5,605	957	912	960	4,676	164	209	161	929
1975–79	1,109	1,109	1,109	5,545	928	924	930	4,582	181	185	179	963
1980–84	1,265	1,265	1,269	6,329	1,044	1,035	1,068	5,232	221	230	201	1,097
1985–89	1,319	1,319	1,322	6,598	1,091	1,076	1,123	5,434	228	243	199	1,164
1990–94	1,366	1,366	1,368	6,832	1,089	1,068	1,145	5,489	277	298	223	1,343
1995–2000	1,486	1,486	1,490	7,434	1,168	1,152	1,231	5,848	318	334	259	1,586
	Men				College				Non-College			
1945–49	210	513	791	2,462	238	249	456	1,530	762	751	545	3,471
1950–54	272	569	891	2,925	353	367	546	2,036	856	842	663	4,009
1955–59	362	660	986	3,418	425	475	630	2,459	990	940	786	4,617
1960–64	324	620	841	3,013	389	448	614	2,386	884	825	660	3,980
1965–69	322	563	808	2,859	377	456	552	2,292	794	715	621	3,565
1970–74	323	546	779	2,735	399	478	607	2,450	722	643	514	3,155

(*continued*)

Table 6.1 (continued)

Birth Cohort	Lowest	Middle	Highest	All	Lowest	Middle	Highest	All	Lowest	Middle	Highest	All
	Men				College				Non-College			
1975–79	297	522	730	2,661	424	494	599	2,477	685	615	510	3,068
1980–84	334	663	885	3,139	504	584	721	2,912	761	681	548	3,417
1985–89	371	604	891	3,130	501	598	757	3,014	818	721	565	3,584
1990–94	398	651	928	3,294	532	591	750	3,108	834	775	618	3,724
1995–2000	428	779	1,023	3,699	558	656	854	3,420	928	830	636	4,014
	Women				Men, White, College				Women, Nonwhite, Non-College			
1945–49	790	487	210	2,539	45	103	351	744	50	41	9	194
1950–54	937	640	318	3,120	72	153	391	977	63	70	33	279
1955–59	1,053	755	430	3,658	85	207	410	1,104	76	80	30	310
1960–64	949	653	433	3,353	88	170	375	1,011	71	64	35	300
1965–69	849	608	365	2,998	81	166	344	945	59	59	30	267
1970–74	798	575	342	2,870	99	180	372	1,011	72	63	26	269
1975–79	812	587	379	2,884	93	172	339	981	66	52	37	277
1980–84	931	602	384	3,190	92	233	427	1,219	77	65	35	318
1985–89	948	715	431	3,468	109	229	454	1,250	90	70	41	351
1990–94	968	715	440	3,538	119	193	449	1,248	118	94	52	411
1995–2000	1,058	707	467	3,735	110	276	517	1,424	154	78	57	487

Source: Author's calculations.

observations fall in the lowest lifetime earnings quintile, compared to only 12 percent in the highest quintile. Similar remarks apply to the distribution of observations for the nonwhite and non–college educated groups.

Longevity

Since Social Security pays its benefits in the form of annuities, how long one lives is a critical factor in determining how much one benefits from the system. Table 6.2 reports average ages of death by cohort and demographic group. As one would expect, later-born cohorts live longer, females outlive males, whites outlive nonwhites, and those with a college education outlive those without. The average age of death for the first five cohorts is 79.5, compared with 81.1 for the last five. Across the entire sample, females outlive males by 6.3 years, but this gap in longevity narrows somewhat between the earliest and latest cohorts. The longevity gaps between whites and nonwhites of about two years, and between the college educated and non–college educated of about 1.5 years, are fairly stable over time.

There is also a clear correlation between lifetime earnings and average length of life. Part of this correlation runs from earnings to lifespan; in other words, the mortality probabilities used in the CORSIM model are smaller the higher is the level of earnings. However, part runs from lifespan to earnings: Those with shorter lifetimes have fewer years during which to work and may, for that reason, have lower lifetime earnings. Across all cohorts, the difference in longevity between those in the bottom and those in the top quintiles is 1.2 years. However, if one looks within male and female subpopulations, these differences are much larger. Compare, for example, highest- and lowest-quintile life expectancies for men who are in cohort 85. The difference is 7.1 years. For females in the same cohort, the gap is 2.8 years between the top and bottom quintiles.[6]

Longevity differences between the college-educated and non–college educated are worth noting. As mentioned, there is a significant college–non-college difference in average longevity. Given the level of education, however, there is very little difference in life expectancies across lifetime income quintiles. Indeed, college graduates in the lowest quintile of the lifetime earnings distribution have a higher life expectancy than do non-college graduates in the top quintile. Thus, education appears to trump income in explaining longevity.

6. Note that the male and female cohort 85 gap in life expectancies between lowest and highest quintiles are smaller than the corresponding gap for male and female observations combined. The reason is that in forming the overall life expectancies, low quintile males and high quintile females receive relatively little weight because there are relatively few of them. This weighting pattern makes the average life expectancy of all those in the lowest quintile closer to that of females in that quintile and makes the average life expectancy of all those in the highest quintile closer to that of males in that quintile. Since, other things being equal, males have lower life expectancies than do females, this weighting pattern reduces the size of the top-bottom quintile gap relative to the gaps of either sex calculated separately.

Table 6.2 **Average Age of Death by Present Value of Earnings Quintiles**

Birth Cohort	Lowest	Middle	Highest	All	Lowest	Middle	Highest	All	Lowest	Middle	Highest	All
	All				White				Nonwhite			
1945–49	79.1	78.8	79.6	79.1	79.6	79.2	79.5	79.3	74.7	75.6	81.2	76.7
1950–54	79.6	77.9	79.4	78.9	80.1	78.2	79.4	79.1	74.8	76.4	79.9	77.4
1955–59	79.5	79.2	80.0	79.5	80.0	79.4	80.2	79.8	75.5	77.8	78.9	77.6
1960–64	79.9	79.3	81.3	79.9	80.4	79.8	81.4	80.2	77.0	76.3	81.1	78.2
1965–69	79.0	80.1	81.7	80.2	79.6	80.0	81.5	80.4	75.1	80.7	82.7	79.2
1970–74	80.0	81.3	81.2	80.7	80.5	81.6	81.0	81.0	77.1	80.2	82.8	79.2
1975–79	80.2	80.8	82.0	81.0	80.7	80.7	82.0	81.3	77.7	80.9	81.6	79.7
1980–84	81.1	81.0	82.1	81.1	82.1	81.0	82.2	81.4	76.7	80.6	81.8	79.6
1985–89	80.9	81.6	82.7	81.5	81.6	81.8	82.7	81.9	77.5	80.4	82.9	79.9
1990–94	80.7	80.9	82.4	81.2	81.5	81.1	82.8	81.5	77.7	80.1	80.8	79.8
1995–2000	80.0	80.2	81.0	80.6	80.7	80.7	81.4	81.0	77.7	78.4	79.2	78.9
	Men				College				Non-College			
1945–49	70.2	74.3	78.3	75.8	80.4	81.0	79.5	80.4	78.8	78.0	79.7	78.5
1950–54	69.2	74.5	77.9	75.3	80.2	78.7	79.4	79.5	79.3	77.5	79.5	78.6
1955–59	71.6	75.4	78.4	76.0	81.4	79.4	81.2	80.3	78.7	79.1	79.1	79.1
1960–64	71.9	76.0	79.8	76.6	80.7	80.7	82.0	80.8	79.6	78.6	80.6	79.4

1965–69	70.7	75.6	80.1	76.9	79.7	80.7	82.1	80.9	78.7	79.8	81.3	79.8
1970–74	71.9	78.8	79.8	77.3	80.6	82.3	81.0	81.4	79.6	80.5	81.5	80.2
1975–79	72.4	77.3	79.7	77.6	81.6	81.9	83.0	82.1	79.4	79.8	80.8	80.1
1980–84	73.8	77.8	80.5	77.8	82.6	81.9	82.5	82.0	80.2	80.2	81.6	80.4
1985–89	73.8	78.5	80.9	78.3	82.0	82.7	82.9	82.4	80.2	80.6	82.4	80.8
1990–94	74.2	77.2	81.0	78.2	80.9	81.3	82.7	81.6	80.6	80.6	82.1	80.8
1995–2000	74.6	77.3	79.7	78.0	80.9	80.3	81.5	81.3	79.5	80.1	80.3	80.0
	Women				Men, White, College				Women, Nonwhite, Non-College			
1945–49	81.5	83.5	84.5	82.2	74.4	75.0	78.3	77.7	80.2	79.8	84.0	79.8
1950–54	82.6	80.9	83.8	82.3	73.1	75.2	77.7	76.3	83.4	77.7	84.0	80.7
1955–59	82.2	82.5	83.8	82.8	72.2	76.2	79.7	77.3	80.0	80.5	82.7	81.2
1960–64	82.7	82.6	84.2	82.9	72.6	78.7	80.6	77.7	79.9	77.6	83.7	79.9
1965–69	82.2	84.4	85.1	83.4	69.6	75.1	80.2	77.5	80.7	85.1	84.6	83.0
1970–74	83.2	83.7	84.5	83.9	74.9	79.4	79.3	78.3	82.1	82.5	85.0	81.7
1975–79	83.1	83.8	86.2	84.1	75.3	76.5	81.4	79.2	79.8	83.4	84.3	82.8
1980–84	83.8	84.4	85.9	84.4	78.9	77.8	81.2	78.9	78.1	82.2	84.0	82.0
1985–89	83.7	84.1	86.5	84.4	76.6	79.8	81.2	79.8	78.4	82.4	86.3	81.6
1990–94	83.4	84.3	85.4	83.9	75.5	77.4	82.2	79.4	82.2	83.5	87.1	82.5
1995–2000	82.2	83.4	83.8	83.2	75.5	77.7	80.6	79.4	80.5	80.8	80.8	81.2

Source: Author's calculations.

Lifetime Earnings

Table 6.3 shows the huge gulf that separates high and low earners with respect to the present value of lifetime earnings. For cohort 45, average lifetime earnings in the top quintile are thirty-three times those in the bottom quintile. For cohort 95, the corresponding factor is thirty-nine. The table also shows that postwar males have much higher average lifetime earnings than do postwar females. In cohort 85, for example, females average $398,300 in lifetime earnings, compared with $731,800 for males. This over-$300,000 differential is much larger than the white-nonwhite and college-non–college educated differentials in cohort 85. Indeed, in this cohort, the white-nonwhite differential is less than $100,000 and the college-non–college differential is less than $200,000. In combination, these differentials can be very sizeable, although their interactions are not necessarily positive. Take white, college-educated males in cohort 85 and nonwhite, non–college educated females in the same cohort. The lifetime earnings difference, which is in excess of $500,000, is nonetheless smaller than the sum of the separate male-female, white-nonwhite, and college educated-non–college educated differentials.

Although lifetime earnings are higher in general for men than for women, for whites than for nonwhites, and for the college-educated than for the non–college educated, these differences do not necessarily extend to within-quintile comparisons. For example, the lowest quintile males have lower lifetime earnings than the lowest quintile females.

Another prominent feature of table 6.3 is the growth over time in lifetime earnings measured in 1998 dollars. This reflects historic as well as projected growth in real wages. As a comparison of results for different members of cohorts 1945–49 and 1995–2000 makes clear, lifetime earnings of successive generations are growing much more rapidly for women than for men, and somewhat more rapidly for whites than for nonwhites and for the college-educated than for the non–college educated.

6.3.2 ESPLanner's Social Security Benefit Calculator (SSBC)

ESPLanner's OASI benefit calculator calculates retirement, spousal, widow(er), mother, father, children, and divorcee benefits as well as OASI taxes. It does so by taking into account Social Security's earnings test, family benefit maximums, actuarial reductions and increases, benefit recomputations, eligibility rules, the ceiling on taxable earnings, and legislated changes in normal retirement ages. Although the benefit calculator considers the OASI system in great detail, it leaves out the disability insurance (DI) portion of Social Security as well as the Supplemental Security Income (SSI) program. It also ignores the taxation of Social Security benefits under federal and state income taxes. Both of these omissions lead to an understatement of Social Security's redistribution from the lifetime rich to the lifetime poor.

Table 6.3 **Average Present Value Earnings by Present Value of Earnings Quintiles**

Birth Cohort	Lowest	Middle	Highest	All	Lowest	Middle	Highest	All	Lowest	Middle	Highest	All
	All				White				Nonwhite			
1945–49	33.4	254.8	1,107.7	394.6	33.0	254.9	1,112.8	399.3	38.0	254.4	1,046.8	356.4
1950–54	33.4	248.8	1,117.7	394.1	33.7	248.9	1,129.2	398.1	31.1	247.9	1,024.0	366.6
1955–59	36.2	251.9	1,307.1	435.4	36.5	252.3	1,319.3	445.0	34.4	249.5	1,186.1	366.4
1960–64	35.4	241.8	1,465.3	464.4	35.7	241.3	1,452.7	466.5	33.3	244.5	1,560.2	451.1
1965–69	34.5	253.4	1,435.8	466.8	34.6	253.6	1,451.8	478.0	33.6	252.2	1,322.1	402.9
1970–74	35.6	255.4	1,509.0	481.5	35.2	255.7	1,504.9	487.0	38.4	253.8	1,533.4	453.7
1975–79	37.8	263.9	1,516.6	489.3	38.1	264.4	1,546.9	499.4	36.5	261.6	1,359.3	440.9
1980–84	36.3	274.5	1,671.7	529.4	35.8	274.9	1,725.7	546.3	38.7	272.3	1,384.6	448.9
1985–89	41.8	284.3	1,773.3	556.5	41.7	284.5	1,802.2	571.3	41.9	283.2	1,610.2	487.5
1990–94	43.6	292.2	1,717.1	552.4	42.7	293.3	1,736.5	568.3	47.1	288.5	1,617.7	487.5
1995–2000	48.3	325.0	1,872.6	605.7	49.0	325.7	1,899.3	628.3	45.9	322.4	1,745.8	522.3
	Men				College				Non-College			
1945–49	21.6	258.8	1,105.0	549.2	31.9	258.0	1,185.2	514.1	33.9	253.8	1,042.8	341.9
1950–54	27.5	251.1	1,129.8	533.8	32.1	251.0	1,208.7	490.3	34.0	247.8	1,042.7	345.2
1955–59	32.8	256.8	1,325.3	570.7	35.5	251.8	1,414.8	533.2	36.5	252.0	1,220.8	383.3
1960–64	33.2	243.2	1,519.2	611.1	34.2	239.8	1,629.6	588.5	35.9	242.8	1,312.5	390.0
1965–69	31.4	255.6	1,459.0	605.7	33.3	253.1	1,556.2	557.4	35.1	253.5	1,328.8	408.5
1970–74	34.5	257.6	1,466.8	607.9	35.2	256.2	1,613.6	581.1	35.9	254.7	1385.4	404.2

(*continued*)

Table 6.3 (continued)

Birth Cohort	Lowest	Middle	Highest	All	Lowest	Middle	Highest	All	Lowest	Middle	Highest	All
	Men				College				Non-College			
1975–79	38.1	265.3	1,551.4	630.7	36.6	266.6	1,587.0	572.2	38.6	261.7	1,433.9	422.3
1980–84	33.9	279.2	1,636.0	668.9	36.4	276.1	1,787.8	634.4	36.2	273.1	1,519.0	440.0
1985–89	41.2	285.7	1,815.2	731.8	42.6	285.8	1,818.8	659.3	41.3	283.0	1,712.4	470.1
1990–94	39.3	295.2	1,718.8	705.4	41.1	295.1	1,862.6	662.0	45.2	290.1	1,540.6	461.0
1995–2000	46.4	329.0	1,881.9	768.1	47.1	330.4	2,027.5	739.5	49.0	320.7	1,664.7	491.7
	Women				Men, White, College				Women, Nonwhite, Non-College			
1945–49	36.6	250.6	1,117.7	244.6	15.8	264.4	1,202.4	733.1	37.5	248.0	1,089.3	242.6
1950–54	35.1	246.7	1,083.7	263.1	23.6	257.8	1,247.9	677.2	24.3	250.1	942.1	278.9
1955–59	37.4	247.7	1,265.4	308.9	27.3	258.2	1,485.6	729.3	24.3	247.8	1,111.8	286.0
1960–64	36.2	240.4	1,360.7	332.6	29.8	240.9	1,665.4	794.8	31.0	250.8	1,081.0	298.8
1965–69	35.7	251.2	1,384.5	334.3	27.0	257.3	1,639.4	787.6	29.0	256.2	1,151.1	309.9
1970–74	36.1	253.2	1,605.1	361.1	29.1	257.6	1,561.2	753.1	31.3	251.4	1,425.6	311.7
1975–79	37.8	262.7	1,449.6	358.7	31.6	267.1	1,700.7	786.5	34.0	268.6	1,403.3	366.6
1980–84	37.1	269.2	1,753.9	392.2	28.4	280.4	1,763.4	824.2	31.2	263.4	1,048.2	330.4
1985–89	42.0	283.1	1,686.6	398.3	37.7	288.1	1,931.5	909.8	38.0	275.4	1,560.6	379.9
1990–94	45.3	289.6	1,713.6	410.0	31.1	302.1	1,868.5	890.6	46.7	289.8	1,390.9	373.8
1995–2000	49.1	320.6	1,852.4	444.8	42.1	335.6	2,091.9	1,002.1	42.3	314.5	1,741.6	403.5

Source: Author's calculations.

Calculation of OASI benefits is extremely complex. The *Social Security Handbook* describing the rules governing these benefits runs over 500 pages. Even so, on many key points, the *Handbook* is incomplete and misleading. This assessment is shared by the Social Security senior actuaries who were consulted in developing SSBC. Their assistance, which proved invaluable, came in the form of both extensive discussions and the transmittal of numerous documents detailing various aspects of Social Security's benefit formulae. The Social Security actuaries also introduced us to their ANYPIA program, which calculates primary insurance amounts (PIAs). Unfortunately, ANYPIA considers only one person at a time and does not permit the calculation of multiple, interdependent benefits of household members. Consequently, ANYPIA did not provide an alternative to developing SSBC, although we have used it, where possible, to check SSBC's accuracy. We refer readers to Caldwell et al. (1998) for a detailed discussion of SSBC's calculation of each type of benefit.

6.4 OASDI's Treatment of Postwar Americans Assuming No Tax Hikes or Benefit Cuts

Tables 6.4 through 6.6 summarize a number of the findings in Caldwell et al. (1999) about Social Security's treatment of current generations assuming no future change in Social Security tax and benefit provisions. Table 6.4 reports cohort-specific OASI lifetime net tax rates for the lowest, middle, and highest lifetime earnings quintiles and for different demographic groups. These tax rates are calculated by dividing (a) the sum of lifetime net taxes of all individuals in a given cell by (b) the sum of those individuals' lifetime earnings. These lifetime variables are present values (discounted at a real rate of 5 percent), measured in 1998 dollars and calculated as of the year the individual is age eighteen. The taxes and benefits used in forming the lifetime net tax rate are all OASI taxes paid by cell members *plus* those paid by their employers and all OASI benefits received by cell members. Thus, spousal and widow(er) benefits are credited to the recipients—the dependent spouse or widow(er)—and not to the spouse who paid the taxes that procured those benefits. For example, a spousal benefit paid to a husband is counted as his benefit notwithstanding the fact that the benefit is based on his wife's earnings record.

Table 6.5 reports cohort-specific OASI internal rates of return, again broken down by lifetime earnings quintiles. The cell-specific internal rates of return were determined by finding the discount rate that equated the present value of the aggregate tax payments of cell observations to the present value of the aggregate benefit receipts of cell observations.

Table 6.6 shows cell-specific OASI equivalent wealth tax rates. These tax rates are calculated by (a) present valuing to age sixty-five (accumulating to age sixty-five or, as appropriate, discounting to age sixty-five) all

Table 6.4 **Lifetime Net Tax Rates by Present Value of Earnings Quintiles**

Birth Cohort	Lowest	Middle	Highest	All	Lowest	Middle	Highest	All	Lowest	Middle	Highest	All
	All				White				Nonwhite			
1945–49	−4.2	6.1	5.0	5.3	−4.3	6.1	4.9	5.3	−3.8	6.4	5.2	5.7
1950–54	−7.9	5.1	4.9	4.8	−8.0	5.0	4.9	4.7	−7.0	5.5	5.3	5.3
1955–59	−5.0	5.5	5.0	5.1	−5.1	5.4	5.0	5.0	−4.2	6.0	5.5	5.6
1960–64	−4.6	5.9	4.9	5.2	−4.6	5.7	5.0	5.2	−4.1	6.6	4.4	5.1
1965–69	−3.9	6.0	5.3	5.5	−4.0	5.9	5.3	5.5	−3.2	6.0	5.6	5.8
1970–74	−3.4	5.7	5.3	5.4	−3.8	5.7	5.3	5.4	−1.7	6.1	5.0	5.4
1975–79	−3.7	5.8	5.4	5.5	−3.2	5.7	5.3	5.4	−5.9	6.2	6.0	5.9
1980–84	−4.8	5.6	5.3	5.4	−5.2	5.5	5.2	5.3	−3.2	5.8	6.2	6.0
1985–89	−4.0	5.5	5.0	5.1	−4.3	5.3	5.0	5.1	−2.9	6.0	5.3	5.5
1990–94	−3.5	5.4	5.3	5.3	−4.5	5.3	5.3	5.3	.0	5.8	5.3	5.5
1995–2000	−2.9	5.5	5.4	5.4	−3.3	5.3	5.3	5.2	−1.4	6.2	5.9	5.9
	Men				College				Non-College			
1945–49	2.2	6.8	5.2	5.8	−6.0	5.5	4.8	5.0	−3.7	6.3	5.1	5.6
1950–54	1.8	5.9	5.0	5.4	−9.4	4.7	4.5	4.5	−7.3	5.2	5.3	5.0
1955–59	2.1	6.5	5.2	5.6	−6.7	5.4	4.6	4.8	−4.4	5.6	5.5	5.3
1960–64	2.7	6.7	5.0	5.6	−6.0	5.5	4.4	4.8	−4.0	6.1	5.5	5.6

1965–69	3.7	6.8	5.4	5.9	−6.3	5.9	4.9	5.2	−2.8	6.0	5.8	5.8
1970–74	3.7	6.4	5.6	5.9	−4.3	5.4	5.0	5.2	−3.0	6.0	5.7	5.7
1975–79	4.0	6.5	5.5	5.9	−5.1	5.6	5.1	5.3	−2.8	5.9	5.7	5.7
1980–84	4.1	6.3	5.6	5.9	−6.1	5.4	5.0	5.2	−3.9	5.7	5.7	5.7
1985–89	2.2	6.1	5.1	5.5	−4.6	5.1	4.9	5.0	−3.7	5.7	5.2	5.3
1990–94	1.9	6.1	5.5	5.7	−5.3	5.3	5.0	5.1	−2.5	5.5	5.8	5.6
1995–2000	1.3	5.9	5.5	5.7	−4.9	5.4	5.0	5.0	−1.8	5.5	6.0	5.8
	Women				Men, White, College				Women, Nonwhite, Non-College			
1945–49	−5.2	5.4	4.0	4.3	1.5	6.5	5.0	5.4	−4.8	6.1	3.9	5.1
1950–54	−10.1	4.3	4.6	3.7	.5	5.7	4.5	4.9	−22.2	5.1	4.8	4.5
1955–59	−7.2	4.7	4.7	4.2	1.3	6.4	4.6	5.0	−14.1	5.6	5.5	5.0
1960–64	−6.8	5.0	4.8	4.6	4.1	6.2	4.6	5.1	−6.7	6.3	6.1	5.9
1965–69	−6.4	5.1	5.1	4.9	2.3	7.1	4.9	5.4	−13.6	5.6	6.5	5.8
1970–74	−6.2	5.1	4.7	4.6	3.3	6.2	5.4	5.6	−8.7	5.6	5.2	5.2
1975–79	−6.5	5.1	5.0	4.7	2.8	6.5	5.0	5.4	−12.0	5.7	5.7	5.2
1980–84	−7.7	4.8	4.7	4.5	2.0	6.2	5.2	5.6	−11.1	5.3	7.3	6.0
1985–89	−6.4	4.9	4.7	4.6	.7	5.6	4.9	5.2	−8.1	5.4	5.6	5.4
1990–94	−5.4	4.8	5.0	4.7	.6	6.0	5.1	5.4	−1.2	5.2	5.3	5.3
1995–2000	−4.6	5.0	5.2	4.9	−.2	5.6	5.0	5.1	−3.1	5.7	5.9	5.6

Source: Author's calculations.

Table 6.5 **Internal Rates of Return by Present Value of Earnings Quintiles**

Birth Cohort	Lowest	Middle	Highest	All	Lowest	Middle	Highest	All	Lowest	Middle	Highest	All
	All				White				Nonwhite			
1945–49	5.7	2.4	.8	1.9	5.7	2.5	.8	2.0	5.7	2.1	1.0	1.9
1950–54	6.7	2.6	.8	2.1	6.7	2.7	.8	2.1	6.7	2.2	1.0	1.9
1955–59	6.2	2.6	.7	1.9	6.2	2.6	.7	1.9	6.1	2.3	.7	1.9
1960–64	6.0	2.6	.6	1.8	6.0	2.6	.6	1.8	6.0	2.0	.7	1.7
1965–69	5.9	2.6	.7	1.8	5.9	2.6	.7	1.8	5.8	2.6	.9	1.9
1970–74	5.8	2.8	.6	1.8	5.9	2.8	.6	1.8	5.4	2.6	.9	1.9
1975–79	5.8	2.7	.8	1.9	5.7	2.7	.8	1.9	6.2	2.5	.8	1.9
1980–84	6.0	2.8	.7	1.9	6.1	2.8	.7	1.9	5.7	2.6	.7	1.8
1985–89	5.9	2.9	.9	2.0	6.0	3.0	.8	2.0	5.7	2.6	1.0	2.0
1990–94	5.8	2.9	.9	2.0	6.0	2.9	.9	2.0	5.0	2.6	.8	1.9
1995–2000	5.7	2.8	.6	1.9	5.8	2.9	.7	1.9	5.4	2.3	.3	1.7
	Men				College				Non-College			
1945–49	4.3	1.6	.5	1.0	6.0	2.8	.8	1.9	5.7	2.3	.9	2.0
1950–54	4.3	1.8	.5	1.1	6.9	2.9	.9	2.0	6.6	2.5	.8	2.1
1955–59	4.3	1.7	.4	1.0	6.4	2.7	.8	1.8	6.0	2.5	.5	1.9
1960–64	4.0	1.7	.3	.9	6.2	2.9	.8	1.8	5.9	2.4	.5	1.8

1965–69	3.7	1.7	.4	.9	6.3	2.7	.8	1.8	5.6	2.5	.6	1.8
1970–74	3.7	2.1	.4	1.0	5.9	3.0	.6	1.8	5.7	2.6	.7	1.9
1975–79	3.6	2.0	.4	1.1	6.0	2.9	.9	1.9	5.6	2.6	.6	1.9
1980–84	3.6	2.2	.5	1.1	6.2	2.9	.8	1.8	5.9	2.7	.7	2.0
1985–89	4.3	2.3	.6	1.3	6.0	3.1	.9	2.0	5.8	2.7	.8	2.1
1990–94	4.4	2.2	.7	1.3	6.1	3.0	.9	1.9	5.6	2.8	.9	2.1
1995–2000	4.6	2.4	.4	1.3	6.1	2.9	.7	1.9	5.4	2.8	.5	1.9
	Women				Men, White, College				Women, Nonwhite, Non-College			
1945–49	5.9	3.0	1.7	3.2	4.5	1.7	.5	.9	5.9	2.5	1.7	2.6
1950–54	7.0	3.2	1.6	3.2	4.8	1.9	.5	1.0	9.1	2.5	1.4	2.6
1955–59	6.5	3.1	1.3	2.9	4.5	1.8	.5	.9	8.2	2.5	1.0	2.5
1960–64	6.4	3.2	1.2	2.7	3.3	2.1	.4	.8	6.5	2.1	.9	2.0
1965–69	6.3	3.2	1.3	2.7	4.2	1.6	.4	.8	8.2	2.9	1.0	2.4
1970–74	6.3	3.2	1.2	2.8	3.9	2.2	.2	.8	6.8	2.8	1.1	2.5
1975–79	6.3	3.2	1.4	2.8	4.0	2.0	.6	1.1	7.2	2.8	1.0	2.5
1980–84	6.5	3.3	1.3	2.8	4.4	2.1	.5	1.0	7.3	2.9	1.0	2.4
1985–89	6.3	3.3	1.4	2.8	4.8	2.6	.6	1.2	6.5	2.8	1.1	2.4
1990–94	6.1	3.3	1.3	2.7	4.8	2.3	.7	1.3	5.3	3.0	1.6	2.5
1995–2000	6.0	3.2	.9	2.6	5.1	2.5	.6	1.3	5.7	2.7	.4	2.2

Source: Author's calculations.

Table 6.6 **Wealth Tax Rates by Present Value of Earnings Quintiles**

Birth Cohort	Lowest	Middle	Highest	All	Lowest	Middle	Highest	All	Lowest	Middle	Highest	All
	All				White				Nonwhite			
1945–49	−35.3	61.5	75.6	66.3	−35.1	60.9	75.7	66.2	−37.4	65.8	74.7	67.1
1950–54	−89.9	56.3	75.0	63.3	−90.6	55.5	75.0	63.0	−82.5	61.3	74.6	65.3
1955–59	−54.8	57.8	76.9	66.0	−55.9	57.1	76.9	65.9	−45.6	61.7	76.9	66.3
1960–64	−46.5	58.4	77.7	67.7	−47.2	57.2	77.7	67.6	−41.1	65.6	77.6	68.7
1965–69	−38.1	58.1	77.8	68.1	−39.1	58.0	77.9	68.2	−31.2	58.7	76.6	67.2
1970–74	−33.7	55.6	78.2	67.5	−36.9	54.9	78.4	67.5	−16.7	58.7	76.6	67.5
1975–79	−35.9	56.7	77.4	67.0	−31.8	56.1	77.4	67.0	−57.6	59.8	77.1	67.0
1980–84	−46.8	55.0	77.6	67.1	−50.8	54.5	77.6	67.1	−30.1	57.5	77.3	67.4
1985–89	−40.0	53.6	76.7	65.7	−42.4	52.5	76.9	65.6	−28.5	58.4	75.7	66.1
1990–94	−34.7	53.6	75.9	65.4	−44.7	52.6	75.8	65.2	−.5	57.3	76.8	66.6
1995–2000	−28.9	53.8	77.5	65.8	−32.6	51.8	77.0	65.2	−14.3	60.6	79.5	68.3
	Men				College				Non-College			
1945–49	20.6	69.4	77.4	74.5	−51.2	56.0	76.2	67.5	−30.7	63.3	75.0	65.6
1950–54	20.0	65.3	76.7	72.4	−109.5	53.7	74.7	64.6	−82.5	57.4	75.2	62.5
1955–59	22.3	66.4	78.6	73.7	−74.8	56.8	75.9	66.9	−46.8	58.3	77.7	65.3
1960–64	26.5	66.4	79.2	74.6	−60.3	54.4	77.1	68.2	−40.6	60.5	78.2	67.4

1965–69	36.4	66.7	79.3	74.8	−64.3	57.7	77.3	68.6	−26.8	58.4	78.2	67.7
1970–74	36.1	62.1	79.5	74.1	−42.2	52.6	78.6	68.5	−29.1	57.9	77.7	66.6
1975–79	39.6	64.3	79.4	73.8	−50.6	55.2	76.5	67.4	−27.5	57.9	78.4	66.6
1980–84	39.7	61.7	78.9	73.5	−59.5	53.1	77.4	68.1	−38.3	56.6	77.8	66.1
1985–89	21.4	59.7	78.3	72.2	−45.4	50.5	76.5	66.6	−36.5	56.2	77.1	64.7
1990–94	19.1	60.6	76.8	71.1	−51.4	52.9	76.0	66.6	−24.8	54.2	75.8	64.3
1995–2000	13.2	58.1	78.0	70.6	−49.5	53.4	77.0	66.4	−17.3	54.1	78.1	65.2
	Women				Men, White, College				Women, Nonwhite, Non-College			
1945–49	−43.1	53.2	67.8	49.8	13.8	67.9	77.9	75.2	−45.2	60.0	66.2	56.4
1950–54	−115.7	48.0	70.0	46.7	5.7	64.2	76.5	72.8	−250.8	56.7	70.4	54.7
1955–59	−78.7	49.7	72.8	53.3	14.0	65.1	77.6	74.1	−160.2	57.7	74.5	58.1
1960–64	−69.8	50.6	74.5	57.3	39.6	61.8	78.6	75.2	−68.5	64.6	75.8	64.2
1965–69	−62.5	50.0	74.3	57.4	23.6	68.1	79.1	75.7	−127.4	53.2	75.7	60.0
1970–74	−61.3	49.4	75.2	57.0	31.3	60.2	80.1	75.4	−84.0	54.5	75.3	59.4
1975–79	−63.8	49.9	73.1	56.4	29.9	64.9	78.1	73.7	−121.8	54.9	75.2	58.7
1980–84	−75.8	47.3	74.4	56.4	19.1	62.2	78.6	74.3	−107.6	53.0	75.3	60.1
1985–89	−63.6	48.4	73.2	55.7	7.3	55.8	78.2	72.6	−80.4	54.4	74.8	60.2
1990–94	−54.0	47.2	74.0	56.8	5.9	59.8	76.5	71.6	−11.4	50.8	70.3	59.6
1995–2000	−44.7	48.9	76.3	58.1	−2.3	55.1	77.1	70.0	−29.6	55.6	79.4	63.0

Source: Author's calculations.

lifetime OASI taxes paid by all cell members, (b) doing the same for all lifetime OASI benefits received by all cell members, and (c) forming the number one minus the ratio of the collective within-cell lifetime benefits to the collective within-cell lifetime taxes. Again, a 5 percent rate of discount is used in finding present values. If the lifetime benefits of cell members equal their lifetime taxes, the implicit OASI wealth tax rate equals zero. If lifetime benefits of cell members are zero, the implicit wealth tax rate is 100 percent.

The reason we refer to this tax rate as an implicit wealth tax is that the accumulated-to-age-sixty-five lifetime tax payments of cell members would be the extra net wealth they would have at age sixty-five if (a) there were no OASI program, (b) all OASI payroll tax contributions were saved and invested by cell members as a group, and (c) these savings earned a real rate of return of 5 percent.[7] If the OASI wealth tax rate is 0.66, this means that Social Security has, in effect, taxed away two-thirds of that net wealth when the surviving cell members reach age sixty-five. Another way to think about OASI is that it represents an insurance policy. From this perspective, the contributions are insurance premiums and the implicit wealth tax is the load charged by the OASI insurance company. A wealth tax rate of 0.66 translates into a load of 66 cents per dollar of premium.

Since we are pooling together the outcomes of all cell observations in forming the cell entries in tables 6.4 through 6.6 as well as subsequent tables, we are making actuarial calculations. Individuals who die young and receive benefits for only a few years are pooled with those who die old and receive benefits for many years. Individuals who parent multiple children and, if they die when the children are young, endow their children with child survivor benefits and their spouses with mother/father benefits, are pooled with those who have no children and, therefore, generate no such benefits. Individuals who are married for ten or more years and, because they have the right constellation of earnings and death dates vis-à-vis their spouses, provide their spouses with spousal and survivor benefits, are pooled with both individuals who never married and with individuals who marry but are divorced before ten years and, consequently, disqualify their former spouses for such benefits.[8,9]

7. We take a 5 percent real rate of return as a reasonable approximation of available market rates of return, comprising of a risk-free rate of 3.5 percent and a risk premium of 1.5 percent.

8. Since surviving spouses are eligible for survivor benefits provided they have been married for nine or more months, we refer here only to the case of marriages of less than ten years that end in divorce in which a spouse dies after the couple has divorced.

9. Note that we allocate benefits to recipients rather than to the individuals whose earnings records generated the benefits. Hence, load factors are likely to be understated for those demographic groups who receive sizable benefits based on the earnings of individuals belonging to some other demographic group. Women, for example, have lower earnings and live longer than men on average and, therefore, receive spousal and survivor benefits based on

6.4.1 Lifetime Net Tax Rates Under the Existing System

Table 6.4 documents several key features of the current OASI system. First, with the exception of cohort 50, lifetime net tax rates exceed 5 percent for almost all postwar cohorts. Second, there is no clear cohort time trend. Younger cohorts are not, under current law, generally facing higher lifetime net tax rates than older cohorts. Third, lifetime net tax rates are negative for members of all cohorts who fall within the lowest 20 percent of their cohort's lifetime earnings distribution. Fourth, the lifetime net tax rates of the middle class (the middle or 3rd quintile of the lifetime earnings distribution) exceed those of the highest quintile of the lifetime earnings distribution.

Thus, the current OASI system represents an overall bad deal for postwar Americans when viewed from an actuarial perspective. One might expect the deal to be worsening over time, given that the OASI tax rate has risen over time. However, life expectancy has increased, and work expectancy has decreased. Hence, younger postwar cohort members are receiving benefits for more years and paying taxes for fewer years than are older postwar cohort members.

The OASI program significantly hurts Americans as a group, but it also significantly helps poor postwar Americans. Take, for example, members of cohort 80 in the lowest lifetime earnings quintile. OASI is, in effect, handing them 4.8 cents on balance for every dollar they earn. Although the system is highly progressive at the bottom of the lifetime earnings distribution, it is somewhat regressive at the top. The regressive nature of the system arises from the ceiling on covered earnings that limits the payroll tax contributions of high earners as well as the benefits high earners receive. Although high earners are facing somewhat lower rates of lifetime net OASI contributions than the middle class, they are still paying, in absolute terms, much more than the middle class. To see this, multiply, for example, table 6.4's 5.3 percent lifetime net tax rate for the highest quintile in cohort 80 by $1,671,700—cohort 80's average lifetime earnings. The resulting $88,600 is over five times the corresponding absolute net tax of $15,372 paid, on average, by members of cohort 80's middle quintile.

Table 6.4 breaks down the lifetime net tax rates by demographic group. Men pay about 1 percent more of their lifetime earnings to OASI in net taxes than do women. The higher male net tax rates obtain even within the same lifetime earnings quintiles. Indeed, the poorest one-fifth of males in each cohort all face positive lifetime net tax rates, whereas the poorest one-fifth of women in each cohort all face negative lifetime net tax rates.

their husbands' earnings histories. The opposite would be true for men. Hence, in drawing conclusions about the size of load factors, it may be appropriate to focus on average wealth tax rates across all groups.

These results reflect males' shorter life expectancies and less frequent receipt of OASI dependent and survivor benefits. Nonwhites, because of their shorter life expectancies, face slightly higher (about a third of a percentage point) lifetime OASI net tax rates than do whites. This is true within as well as across lifetime earnings quintiles. College-educated workers face somewhat lower lifetime OASI net tax rates (about three-fifths of a percentage point) than non–college educated workers. This difference is particularly pronounced among college-educated and non–college educated observations in the first quintile.

6.4.2 Internal Rates of Return Paid by the Existing System

Table 6.5 indicates that postwar cohorts, as a group, are receiving a roughly 2 percent rate of return on their OASI contributions. Relative to the nearly 4 percent safe rate of return currently available on inflation-indexed long-term government treasury bonds, 2 percent is quite low, particularly given the fact that future OASI tax payments and benefit receipts are highly uncertain. Indeed, the nonidiosyncratic component of these tax payments and benefit receipts is closely linked to overall labor productivity growth. Because labor productivity growth is highly correlated with the economy's performance, which, in turn, is highly correlated with the performance of the stock market, the stock market's real rate of return may be a reasonable rate to compare with the 2 percent being paid Social Security. The average real return on the stock market since 1926 is 7.7 percent—a very far cry from 2 percent!

While postwar Americans are, as a group, receiving a quite low rate of return from the system, the poorest among them are earning a very respectable return—roughly 6 percent. The counterpart of this much better deal for the poor is a much worse deal for those in the top quintile. Their rate of return is below 1 percent. In addition to this large difference between rates of return for high and low earners, there is a large difference in rates of return between men and women. The differences between male and female internal rates of return are smaller at higher quintiles. In the case of cohort 70, for example, the difference is 2.6 percentage points in the lowest quintile versus 0.8 percentage points for the highest quintile. This may reflect the fact that a larger fraction of women in the lower lifetime earnings quintiles have longer spells of nonparticipation in the labor market. Hence, women in these quintiles may collect benefits based on their spouses' earnings records with greater frequency than do men—making their benefits larger relative to their earnings. In contrast, women in higher lifetime earnings quintiles mostly collect benefits based on their own earnings records. Their internal rates are, nevertheless, larger than those of men because women collect survivor benefits based on the spouses' higher earnings records and because they possess greater longevity.

The differences between male and female internal rates of return are smaller for later cohorts. For cohort 95, for example, the difference in the lowest quintile is only 1.4 percentage points. In the highest quintile, it is only 0.5 percentage points. The decline in the difference for later cohorts may reflect the increase over time in women's labor force participation—leading to fewer women's collecting benefits based on the spouse's earnings records. Interestingly, and unlike the lifetime net tax measure, the rate-of-return criterion suggests that nonwhites fare just as well as whites and that the non–college educated fare just as well as the college-educated.

6.4.3 Implicit Wealth Taxes Levied by the Current System

Table 6.6 shows the point made above, that roughly two-thirds of every dollar paid by postwar Americans to the OASI system represents a pure tax. Since two-thirds of the 10.6 percent OASI nominal tax rate equals 7.1 percent, the average effective OASI tax rate is 7.1 percent. For high earners, the implicit tax rate is close to eight cents on each dollar earned up to the covered earnings ceiling. For low earners, the system not only pays back in full each dollar paid in, but also provides about forty-five cents on the dollar as a subsidy. Not all poor individuals receive a subsidy, however. None of the poorest fifth of males in the eleven cohorts can expect to get back more than they pay in. Instead, they can expect that for each dollar paid in taxes, they will receive back only seventy-three cents in benefits; that is, they will lose twenty-seven cents per dollar contributed to OASI. Poor women, on the other hand, can anticipate receiving benefits equal to 1.67 cents per dollar paid in (a subsidy of sixty-seven cents). OASI's implicit wealth tax rates are also higher for nonwhites than whites and for the college-educated than the non–college educated.

6.5 Alternative Policies to Shore Up Social Security's Finances

This section examines ten potential policy reforms, all of which have been popularly discussed, that would help shore up Social Security's long-term finances. To set the stage for their analysis, we first point out that the system's present value budget imbalance is very much larger than is generally understood or being publicly acknowledged by the system's trustees.

6.5.1 Social Security's Financial Dilemma

How large is the total present value imbalance of the OASI system? If we discount all future taxes and benefits at a 3 percent real rate, we arrive at a present value imbalance of $8.1 trillion.[10] This figure represents the

10. While we follow the actuaries in using a 3 percent real discount rate in assessing the present value budget impact of alternative policies, a 3 percent discount rate seems far too low for the individual money's worth calculations we make in forming lifetime net tax rates and implicit OASDI wealth taxes. Why? Because future OASI taxes and benefits are highly uncertain and, from an individual perspective, should be discounted for their risk. One could

difference between (a) the present value of all future benefit payments and (b) the sum of the present value of future payroll tax revenue plus the current OASI trust fund.[11]

The immediate and permanent tax hike required to generate $8.1 trillion more in present value and, thus, eliminate the OASI budget imbalance is 4 percentage points or 38 percent of the post-2000 OASI tax rate of 10.6 percent.[12] This requisite 38 percent tax hike is over twice the required rate increase reported in the *1999 Trustee's Report of the Social Security Administration.* The discrepancy between the tax hike that is needed and the one the trustees say is needed is easily explained. Unlike our calculation, the *Trustees' Report* uses a truncated projection horizon—seventy-five years—which ignores the enormous deficits forecast in years seventy-six and thereafter.

One might think that looking out seventy-five years is far enough, but with each passing year, another "out-year" is added to the current seventy-five-year projection horizon. If these out-years involve large deficits, the current seventy-five-year present value imbalance will worsen. This is precisely what has been happening since 1983, when the Greenspan Commission "saved" Social Security. Indeed, about one-third of the current seventy-five-year long-term imbalance in Social Security's finances reflects the fact that since 1983, sixteen years of very large deficits have been added to the seventy-five-year projection horizon. Another third of the seventy-five-year imbalance that has arisen since 1983 reflects mistakes the actuaries made in their forecasting techniques. The final third reflects overly optimistic assumptions the actuaries made about the growth of taxable payroll, take-up rates of disability benefits, and demographics.

The size of the tax hike (38 percent) needed to produce present value balance, not just over the next 75 years but over the entire long run, is even more remarkable given that it was calculated using the relatively optimistic "intermediate" demographic and economic assumptions. Two assumptions in the intermediate set seem particularly sanguine. One is that improvements in longevity will slow down over the next several decades compared with the rate of such improvements observed over the past twenty years. Indeed, if one believes the intermediate longevity forecast, it will

argue that the actuaries should also risk adjust their discount rate in assessing the system's long-term finances.

11. In forming the present values, we use SSA's most recent projections of payroll tax revenue and OASI benefits. We take average annual growth rates of OASI taxes and benefits during the final twenty years of the seventy-five-year projections and grow the year-75 taxes and benefits through the year 2300. Discounting the difference between taxes and benefits at a real discount rate of 3 percent per year, adding the current value of the OASI trust fund, and making an adjustment for the post-2300 imbalance yields the total present value imbalance reported in the text.

12. In a telephone conservation, Social Security's deputy chief actuary, Stephen C. Goss, indicated that he also finds a 38 percent present value imbalance, although his calculations include the DI system. According to Goss, the tax hike required to balance the OASDI system in present value would be 4.7 percentage points.

take the United States until the middle of the next century to achieve the current Japanese life expectancy. The other assumption is real wage growth. Here the actuaries assume a growth rate that is over twice that observed, on average, over the past quarter century.

Under more pessimistic but arguably more realistic assumptions, an immediate and permanent payroll tax hike of more than 6 percentage points and close to 50 percent is needed to ensure that the present value of all future OASDI taxes plus the combined OASDI trust funds equal the present value of all future OASDI benefits. If such a tax hike is not enacted in the short term, even larger tax hikes will be required in the long term. Alternatively, Social Security benefits will have to be dramatically reduced.

6.5.2 Alternative OASI Reforms

All of the reforms we examine are based on the assumption that Social Security continues to finance its benefits on a PAYGO basis. The first two of the ten policies considered here were also examined in Caldwell et al. (1999). These are an immediate and permanent 38 percent increase in the OASI payroll tax rate and an immediate and permanent 25 percent cut in all OASDI benefits. The benefit cut policy generates roughly the same amount of saving in present value as the tax hike and suffices to eliminate Social Security's long-term fiscal imbalance when measured in present value. Our third policy is entitled "Accelerated Increase in the NRA." This policy raises the normal retirement age (NRA) by six months per year after the year 2000 until the normal retirement age is raised to seventy by the year 2010.[13] The fourth policy uses the consumer price index (CPI) rather than the OASI nominal wage index, to index average monthly covered earnings in forming recipients' Average Indexed Monthly Earnings (AIME). Unlike the OASI nominal wage index, which reflects both inflation and improvements in labor productivity, the CPI reflects only inflation. Hence, in placing past earnings on an equal footing with current earnings, CPI indexing provides a credit against inflation during the interim years, but none for productivity growth. Because productivity growth is generally positive, this method reduces progressively the contribution of earnings that accrued earlier during a worker's lifetime and results in a lower AIME. A lower AIME, in turn, yields a lower PIA—the retirement benefit that the worker would receive if he or she begins to collect at the applicable NRA. Note that this policy does not alter the scheduled growth in the bend points used in calculating workers' PIAs from their AIMEs.[14]

13. Those achieving age sixty-five during the year 2001 are assigned an NRA of sixty-five years and six months; those achieving age sixty-five during the year 2002 are assigned NRA = sixty-six, and so on, until the NRA reaches seventy.

14. The PIA equals 90 percent of the first X dollars of AIME plus 32 percent of the AIME exceeding X dollars but less than Y dollars plus 15 percent of the AIME in excess of Y dollars. The nominal values X and Y (the bend points) are announced each year by the Social

Our fifth policy maintains the current formula for calculating initial benefits, but once these benefits commence, they increase over time, not by the CPI, but by the CPI minus 1 percent. The sixth policy is called "Stabilize Real Per Capita Benefits." This policy calculates retirees' primary insurance amounts as prescribed by current law, but then reduces these amounts by post–year-2000 growth in labor productivity. This growth reduction factor means that real OASI benefit levels do not keep pace with economy-wide increases in labor productivity and real wages. The seventh policy maintains the current benefit formula in all respects except one: It grows the bend points used in the calculating PIAs according to inflation rather than the growth in the OASI wage index. Consequently, as real wages grow, successive generations of retirees will find themselves experiencing real "bracket creep," meaning that the benefits of an ever larger percentage of retirees will be computed using the less progressive parts of the benefit formula.

The eighth policy eliminates the ceiling on taxable earnings but does not alter the method of determining benefits, so earnings that are above what would otherwise be the ceiling will be included by OASI in the calculation of benefits. The ninth policy is equivalent to the previous one except for this last feature: It collects taxes without any earnings ceiling but calculates benefits based on the existing earnings ceiling provisions that apply to the future as well as the present. The tenth and final policy increases the years used in computing covered workers' AIME from thirty-five to forty years.

6.5.3 Impact of the Alternative Policies on OASI's Unfunded Liability to Postwar Americans

As mentioned, policies 1 and 2 (the 38 percent immediate and permanent hike in the OASDI tax rate and the 25 percent immediate and permanent benefit cut) both suffice, under the Social Security actuaries' intermediate assumptions, to bring the system's finances into present value balance when its future net cash flows are discounted at a 3 percent real rate of return. Both policies generate approximately \$8 trillion more in net taxes when measured in present value. These additional net taxes would be paid not only by postwar Americans but also by other Americans either alive now or expected to be born in the future.

Table 6.7 shows how these two policies as well as our other eight would affect the net taxes (taxes minus benefits) that postwar Americans will pay, measured in present value. The first row of this table indicates that, under

Security Administration and are scheduled to increase at the rate of growth of average wages lagged by two years. For example, the bend points for 1999 are obtained by multiplying the corresponding 1979 bend point amounts by the ratio between the national average wage index for 1997 (\$27,426.00) and that for 1977 (\$9,779.44). These results are then rounded to the nearest dollar.

Table 6.7 Change in Social Security's Net Liability to Postwar Generations

Policy	Present Value Imbalance	Change from Current Rules
Current rules	1,172.9	
1 38% tax hike beginning in year 2000	−2,874.0	−4,046.9
2 25% benefit cut beginning in year 2000	−2,004.3	−3,177.2
3 Accelerated increase in NRA	−1,089.7	−2,262.5
4 CPI indexing of covered earnings	145.9	−1,026.9
5 Indexing benefits by CPI minus 1%	−231.0	−1,403.9
6 Stabilize real per capita benefits	−3,312.7	−4,485.6
7 Freeze bend points in real terms	−194.9	−1,367.7
8 Eliminate taxable earnings ceiling	−1,048.5	−2,221.4
9 Eliminate taxable ceiling without benefit change	−2,276.7	−3,449.6
10 Increase computation years from 35 to 40	737.9	−435.0

Source: Author's calculations.

current policy, postwar Americans' future benefits exceed their future taxes by about $1.2 trillion; thus, the present value of postwar Americans' future net taxes is negative. This is hardly surprising, given that the baby boom generation is nearing retirement.

Although OASI's $1.2 trillion unfunded net OASI liability to postwar Americans is large, it represents less than 15 percent of the total $8.1 trillion present value budget gap identified above. Thus, the overwhelming majority of OASI's present value imbalance consists not of obligations to postwar Americans but of obligations to the Americans born before 1945—most of whom are now retired.

As table 6.7 indicates, all ten of the policies reduce the system's liability to postwar Americans. Indeed, eight of the ten policies wipe out the liability entirely; of these, six transform postwar Americans' net tax payments into a major implicit asset of the system by making their future benefits far smaller in present value than their future taxes. Take policy 1, the 38 percent tax hike. This policy reduces the unfunded net OASI liability to postwar Americans by over $4 trillion! To put it more directly, this policy forces postwar Americans to resolve, on their own, almost 50 percent of the system's current long-term fiscal imbalance. The same can be said of policies 2, 6, and 9.

6.5.4 Lifetime Net Tax Rates Under Alternative Policies

Tables 6.8 through 6.10 show the impact on lifetime net tax rates of our ten different methods of dealing with OASI's long-term funding shortfall. These tables present results for all members of cohorts 45, 70, and 95, cross-classified by lowest, middle, and highest quintiles of lifetime earnings. They also consider three different real discount rates—our bench-

Table 6.8 The Impact of Potential OASI Reforms on Lifetime Net Tax Rates, All Observations (r = 5%)

	Quintile of Average Benefits			
	Lowest	Middle	Highest	All
Birth cohort 1945–49				
1 Current rules	−4.2	6.1	5.0	5.3
2 38% tax hike beginning in year 2000	−3.9	6.4	5.3	5.7
3 25% benefit cut beginning in year 2000	−0.2	7.1	5.4	6.0
4 Accelerated increase in NRA	−1.7	6.9	5.4	5.9
5 CPI indexing of covered earnings	−3.0	6.4	5.1	5.6
6 Indexing benefits by CPI minus 1%	−2.5	6.5	5.1	5.6
7 Stabilize real per capita benefits	−2.3	6.6	5.2	5.7
8 Freeze bend points in real terms	−3.8	6.3	5.0	5.4
9 Eliminate earnings ceiling	−4.4	6.1	5.3	5.5
10 Eliminate earnings ceiling without benefit change	−4.2	6.1	5.4	5.6
11 Increase computation years from 35 to 40	−3.5	6.3	5.0	5.4
Birth cohort 1970–74				
1 Current rules	−3.4	5.7	5.3	5.4
2 38% tax hike beginning in year 2000	−1.1	8.4	7.1	7.6
3 25% benefit cut beginning in year 2000	0.0	6.9	5.7	6.1
4 Accelerated increase in NRA	−1.6	6.5	5.6	5.9
5 CPI indexing of covered earnings	−2.2	6.1	5.4	5.6
6 Indexing benefits by CPI minus 1%	−1.9	6.2	5.4	5.7
7 Stabilize real per capita benefits	1.9	7.5	5.9	6.5
8 Freeze bend points in real terms	−2.2	6.3	5.5	5.8
9 Eliminate earnings ceiling	−4.1	5.7	7.7	6.9
10 Eliminate earnings ceiling without benefit change	−3.4	5.7	8.2	7.3
11 Increase computation years from 35 to 40	−2.6	5.9	5.3	5.5
Birth cohort 1995–2000				
1 Current rules	−2.9	5.5	5.4	5.4
2 38% tax hike beginning in year 2000	0.9	9.3	8.0	8.4
3 25% benefit cut beginning in year 2000	0.4	6.7	5.8	6.1
4 Accelerated increase in NRA	−1.3	6.2	5.6	5.8
5 CPI indexing of covered earnings	−1.7	5.9	5.5	5.6
6 Indexing benefits by CPI minus 1%	−1.5	5.9	5.5	5.6
7 Stabilize real per capita benefits	6.8	9.0	6.6	7.5
8 Freeze bend points in real terms	−0.9	6.4	5.7	5.9
9 Eliminate earnings ceiling	−3.3	5.5	8.2	7.1
10 Eliminate earnings ceiling without benefit change	−2.9	5.5	8.7	7.5
11 Increase computation years from 35 to 40	−2.2	5.7	5.4	5.5

Source: Author's calculations.

Table 6.9 **The Impact of Potential OASI Reforms on Lifetime Net Tax Rates, All Observations (r = 7%)**

	Quintile of Average Benefits			
	Lowest	Middle	Highest	All
Birth cohort 1945–49				
1 Current rules	4.7	8.4	5.9	6.9
2 38% tax hike beginning in year 2000	5.0	8.6	6.1	7.1
3 25% benefit cut beginning in year 2000	6.5	8.9	6.0	7.2
4 Accelerated increase in NRA	5.9	8.8	6.0	7.2
5 CPI indexing of covered earnings	5.2	8.6	5.9	7.0
6 Indexing benefits by CPI minus 1%	5.4	8.6	5.9	7.0
7 Stabilize real per capita benefits	5.6	8.7	5.9	7.0
8 Freeze bend points in real terms	4.9	8.5	5.9	6.9
9 Eliminate earnings ceiling	4.6	8.4	6.1	7.0
10 Eliminate earnings ceiling without benefit change	4.7	8.4	6.1	7.0
11 Increase computation years from 35 to 40	5.0	8.5	5.9	6.9
Birth cohort 1970–74				
1 Current rules	3.4	8.1	6.2	6.9
2 38% tax hike beginning in year 2000	5.6	10.5	7.9	8.8
3 25% benefit cut beginning in year 2000	5.1	8.7	6.4	7.2
4 Accelerated increase in NRA	4.3	8.5	6.3	7.1
5 CPI indexing of covered earnings	4.0	8.3	6.2	7.0
6 Indexing benefits by CPI minus 1%	4.1	8.3	6.3	7.0
7 Stabilize real per capita benefits	6.1	9.0	6.5	7.4
8 Freeze bend points in real terms	4.0	8.4	6.3	7.0
9 Eliminate earnings ceiling	3.1	8.1	8.6	8.4
10 Eliminate earnings ceiling without benefit change	3.4	8.1	8.8	8.5
11 Increase computation years from 35 to 40	3.8	8.2	6.2	6.9
Birth cohort 1995–2000				
1 Current rules	3.7	7.8	6.3	6.9
2 38% tax hike beginning in year 2000	7.5	11.7	9.0	10.0
3 25% benefit cut beginning in year 2000	5.3	8.4	6.5	7.2
4 Accelerated increase in NRA	4.5	8.2	6.4	7.1
5 CPI indexing of covered earnings	4.3	8.0	6.4	7.0
6 Indexing benefits by CPI minus 1%	4.3	8.0	6.4	7.0
7 Stabilize real per capita benefits	8.5	9.6	6.9	7.9
8 Freeze bend points in real terms	4.7	8.3	6.5	7.2
9 Eliminate earnings ceiling	3.5	7.8	9.2	8.7
10 Eliminate earnings ceiling without benefit change	3.7	7.9	9.5	8.8
11 Increase computation years from 35 to 40	4.1	7.9	6.3	6.9

Source: Author's calculations.

Table 6.10 The Impact of Potential OASI Reforms on Lifetime Net Tax Rates, All Observations (r = 3%)

	Quintile of Average Benefits			
	Lowest	Middle	Highest	All
Birth cohort 1945–49				
1 Current rules	−23.0	1.9	3.3	2.5
2 38% tax hike beginning in year 2000	−22.5	2.4	3.8	3.0
3 25% benefit cut beginning in year 2000	−14.3	3.9	4.1	3.9
4 Accelerated increase in NRA	−17.8	3.5	4.1	3.6
5 CPI indexing of covered earnings	−20.3	2.5	3.5	2.9
6 Indexing benefits by CPI minus 1%	−18.8	2.7	3.7	3.1
7 Stabilize real per capita benefits	−18.9	2.8	3.7	3.1
8 Freeze bend points in real terms	−21.9	2.1	3.5	2.7
9 Eliminate earnings ceiling	−23.4	1.9	3.7	2.7
10 Eliminate earnings ceiling without benefit change	−23.0	1.9	4.0	2.9
11 Increase computation years from 35 to 40	−21.4	2.2	3.4	2.7
Birth cohort 1970–74				
1 Current rules	−17.9	0.9	3.7	2.7
2 38% tax hike beginning in year 2000	−15.5	3.9	5.6	5.0
3 25% benefit cut beginning in year 2000	−10.8	3.3	4.4	4.0
4 Accelerated increase in NRA	−14.4	2.5	4.2	3.5
5 CPI indexing of covered earnings	−15.3	1.7	3.9	3.1
6 Indexing benefits by CPI minus 1%	−14.4	2.0	4.0	3.3
7 Stabilize real per capita benefits	−7.0	4.7	4.8	4.7
8 Freeze bend points in real terms	−15.4	2.0	4.1	3.3
9 Eliminate earnings ceiling	−19.4	0.8	5.9	4.0
10 Eliminate earnings ceiling without benefit change	−17.9	0.9	6.8	4.7
11 Increase computation years from 35 to 40	−16.3	1.3	3.7	2.8
Birth cohort 1995–2000				
1 Current rules	−17.4	0.8	3.7	2.5
2 38% tax hike beginning in year 2000	−13.5	4.6	6.3	5.5
3 25% benefit cut beginning in year 2000	−10.5	3.2	4.5	3.9
4 Accelerated increase in NRA	−14.0	2.1	4.2	3.4
5 CPI indexing of covered earnings	−14.8	1.5	3.9	3.0
6 Indexing benefits by CPI minus 1%	−14.1	1.7	4.0	3.1
7 Stabilize real per capita benefits	3.1	7.9	6.0	6.6
8 Freeze bend points in real terms	−13.1	2.5	4.4	3.6
9 Eliminate earnings ceiling	−18.3	0.7	6.2	4.1
10 Eliminate earnings ceiling without benefit change	−17.4	0.8	7.2	4.7
11 Increase computation years from 35 to 40	−15.9	1.1	3.8	2.7

Source: Author's calculations.

mark rate of 5 percent, a high rate of 7 percent, and a low rate of 3 percent. The group of 32 tables which supplement this paper, which are posted at [http://www.NBER.org/data-appendix/gokhale01] results broken down by demographic subgroup.

Observe first the 5 percent discount rate results for policies 1 and 2 in table 6.8. Implementing either policy would raise the lifetime net tax rates of all postwar generations. However, the two policies have quite different intergenerational incidence. The tax hike hits later generations much harder than it does earlier ones. The benefit cut affects all generations roughly the same. Consider cohorts 45 and 96. The tax hike policy raises cohort 45's lifetime net tax rate from 5.3 percent to just 5.7 percent, but it raises cohort 95's lifetime net tax rate from 5.4 to 8.4 percent. In contrast, the benefit cut policy leaves cohort 45's and 95's lifetime net tax rates at 6.0 percent and 6.1 percent, respectively. Clearly, earlier generations fare better under the tax hike because they have limited remaining labor earnings that are subject to the higher payroll tax rate. In the case of the benefit cut, all generations are similarly hurt because none has yet begun to receive Social Security retirement benefits, which is the lion's share of OASI benefits.

Both of these policies are tougher on the lifetime low earners than on the lifetime high earners in terms of their impact on lifetime net tax rates. For those in the lowest quintile in cohort 95, a 38 percent tax hike means losing close to four cents more per dollar earned to the system.[15] For their contemporaries in the highest quintile, the policy means losing only 2.6 percent more per dollar earned. Under the benefit cut policy, these differences are much more striking. The poorest one-fifth of cohort 95 lose 3.3 percent of their lifetime incomes, whereas the richest fifth lose only 0.4 percent. Finally, it is worth noting that for the bottom quintile in cohort 95 both the tax hike and benefit cut policies transform OASI from a net subsidy into a net tax.

How do policies 3 through 10 compare with policies 1 and 2? In terms of their impact on lifetime net tax rates, the answer is that they fall between policies 1 and 2. Several points are, however, worth stressing. First, policy 3 (the accelerated increase in NRA) hurts older cohorts more than younger cohorts. For example, the overall increase in the lifetime net tax rate for cohort 45 is 0.6, whereas it is only 0.4 for cohort 95. This occurs because current rules already incorporate an increase in the NRA.[16] The accelera-

15. This percentage point increase precisely equals that required for eliminating the OASI imbalance.

16. Under current rules, the NRA is scheduled to increase from sixty-five for those who will achieve age sixty-five in 2002 or earlier to sixty-six for those who will achieve age sixty-five between the years 2007 and 2019. Thereafter, the NRA will increase from sixty-six for those achieving age sixty-five before the year 2020 to sixty-seven for those achieving age sixty-five in 2025.

tion of the increase in NRA hits those about to retire in the near future particularly hard. For example, those reaching age sixty-five in the year 2010 would have a normal retirement age of sixty-six under current rules, but seventy under policy 3. In contrast, the NRA of those reaching age sixty-five after 2022 will increase from sixty-seven under current rules to seventy under policy 3.

Second, policies 6, 7, 8, and 9 ("Stabilize Real Per Capita Benefits," "Eliminate Earnings Ceiling," and "Eliminate Earnings Ceiling without Benefit Change") hurt younger cohorts much more than older ones. Policy 6 eliminates the real growth in benefits under the current system associated with economy-wide productivity growth. Hence, later retiring generations, whose benefits would otherwise be higher than the benefits of those retiring earlier, lose the most from this policy. As mentioned earlier, policy 7 imposes bracket creep: Slower growth in nominal bend point values exposes a greater fraction of each person's AIME to the relatively progressive regions of the PIA formula. Under policy 8, the incremental lifetime earnings subject to payroll taxes are much larger for younger than for older generations because a greater fraction of the former generations' working lifetimes lies the future. However, because of the progressive benefit formula, younger generations' benefits do not keep pace with the increase in their lifetime payroll taxes. The effect is even more pronounced when benefits are held constant under policy 9.

Third, policy 6 (and, to a lesser extent, policy 7) is extremely tough on poor members of young cohorts. For the bottom quintile of cohort 95, policy 6 transforms OASI's 2.9 percent of lifetime earnings net subsidy into a 6.8 percent net tax and leaves this quintile with a higher net tax rate than the top quintile! Note that this policy has a much bigger impact than does policy 4 ("CPI Indexing of Covered Earnings") on the lifetime net tax rates of poor members of young cohorts. The same can be said of middle- and upper-income young cohort members. The reason is that policy 6 directly eliminates all growth in benefits due to overall real wage growth, whereas policy 4 works by reducing the AIME. For those at the upper range of the distribution of lifetime earnings, a 1 percent reduction in the AIME translates into only a 0.15 percent reduction in benefits under policy 4. Policy 7 ("Freeze Bend Points in Real Terms") is particularly damaging to the lifetime poor because it pushes them into lower marginal benefit brackets.

Fourth, policy 9—raising the earnings ceiling without concomitant benefit increases (without permitting the higher covered earnings to be included in the calculation of AIME)—is particularly grievous on young cohort members in the highest lifetime earnings quintile. As can be verified in the bottom panel of table 6.8, policy 9 raises the lifetime net tax rate of cohort 95's top 20 percent of lifetime earners by 3.3 percentage points. In contrast, the poorest members of this cohort experience no change in their lifetime net tax rates.[17]

Fifth, policy 10 ("Increase Computation Years from 35 to 40) leaves unchanged the lifetime net tax rates of the top earning quintiles, whereas it raises those of the lowest and middle quintiles. The lowest quintile in each cohort is especially hard hit. The reason is that members of this quintile have many years in their earnings histories during which they do not work. Including those years in calculating AIME lowers their AIMEs and, thus, their benefit levels.

6.5.5 The Sensitivity of the Results to the Choice of Discount Rates

Tables 6.9 and 6.10 repeat the analysis of table 6.8 but assume discount rates of 3 and 7 percent, respectively. Comparing the same policy across the three tables indicates that the level of lifetime net tax rates is highly sensitive to the choice of discount rates. For example, under current law and assuming a 3 percent discount rate, the lifetime net tax rate of the lowest lifetime earnings quintile in cohort 70 is −17.9 percent. Assuming a 5 percent discount rate, it is −3.4 percent, and assuming a 7 percent discount rate, it is 3.4 percent. Hence, a 400 basis point swing in the choice of the discount rate transforms the OASI system from a huge net subsidy to the poor to a small net tax. The same experiment—moving from a 3 percent to a 7 percent discount rate—raises the current-rules lifetime net tax rate of the middle quintile from 0.8 percent to 7.8 percent, a very dramatic increase.

In contrast, for the highest quintile in cohort 70, the absolute increase in the lifetime net tax rate (in moving from a 3 to a 7 percent discount rate) is only 2.5 percentage points. One reason for this difference is that the lifetime poor have shorter workspans. This makes the denominators of the lifetime net tax rates of the poor less sensitive to the discount rate than the numerators, which makes the net tax rate itself more sensitive. A second reason is that the lifetime poor are paying relatively little in OASI taxes compared to the benefits they receive. This means that changes in the discount rate change the present value of benefits by substantially more than they do the present value of taxes. This point becomes abundantly clear when one considers the case in which taxes equal benefits on an annual basis. In this case, the lifetime net tax rate is zero regardless of the discount rate.

Given the substantial sensitivity of the calculated lifetime OASI net tax

17. In the case of policy 8, the lowest quintiles in all cohorts experience declines in their lifetime net tax rate. The explanation is that many of the observations in these quintiles receive benefits based on their spouses' earnings record and these benefits go up when all of their spouses' earnings are included in the calculation of dependent and survivor benefits, not simply their spouses' earnings up to the covered earnings ceiling.

rates to the assumed discount rate, it is worth pondering which discount rate is most appropriate to use in this context. The answer depends on one's view of the risk of OASI taxes and transfers. If one views these flows as no more risky than, say, the repayment of government debt, the appropriate discount rate would be the real return offered by inflation-indexed treasury bonds. If, on the other hand, these flows are not only risky but subject to fluctuations in line with the stock market, then the expected return on the stock market would be the appropriate benchmark. In the former case, a real discount rate of between 3 and 4 percent would be justified. In the latter case, a rate around 7 percent should be chosen.

As Baxter and King (2001) pointed out, the method of wage-indexing Social Security benefits and the positive correlation between real wage growth and the stock market, suggests that both Social Security taxes and benefits move with the stock market. On the other hand, there are ample examples of changes in Social Security benefit rules that have not coincided with stock market fluctuations. How these political risks would affect the appropriate rate at which to discount Social Security benefits is a subject we are currently researching.

6.5.6 Lifetime Net Tax Rates of Demographic Groups Under Alternative Policies

The male and female results, based on the benchmark 5 percent discount rate, are displayed in website tables 1 and 2. These tables show the same general patterns across policy alternatives as table 6.8. Males and females would generally rank the policy alternatives in the same way, provided they were in the same earnings quintile within the same cohort. As an example, take cohort 95. For middle-income males in this group, the tax hike policy produces the highest net tax rate—9.8 percent. For the bottom quintile males, policy 6 ("Stabilize Real Per Capital Benefits") is the worst, leaving this group facing a 7.9 percent lifetime net tax rate—a full 1.3 percentage points higher than the corresponding rate facing those in the top quintile of this cohort. Moreover, for the top quintile of males, eliminating the earnings ceiling with no benefit change is the worst alternative, producing an 8.7 percent lifetime net tax rate. Middle quintile and bottom quintile females are both harmed the most by policy 6, but in the case of middle quintile females, the tax hike policy is almost as bad; and, like the top quintile males, the top quintile females find policy 9 the worst overall.

Whites and nonwhites within the same cohort and quintile would also rank the policy changes the same. This is also the case for the college-educated and non–college educated. As web site tables 3 through 6 confirm, the really adverse policies for cohort 45 members, regardless of their race or education, are policy 2 and policy 1. For those in the middle quintile of cohort 95, policies 1 and 6 are the worst policies, independent of race and education. If, on the other hand, one does not control for quintile, it is clear that certain policies that are worse for the high earners are better for nonwhites than whites, and for the non–college educated than for the college-educated, because the former groups are overrepresented in the lower quintiles. Policy 9 is an example. For cohort 95, this policy would lower the nonwhite/white and non–college educated/college-educated lifetime net tax rate differentials from 0.7 to 0.1 and from 0.8 to −0.5 percent, respectively.

Web site tables 7 and 8 show the impact of the proposed reforms on college-educated, white males, on the one hand, and non–college educated, nonwhite females on the other. Again, how individual members of these groups fare is primarily a matter of their cohort, their quintile, and the policy selected. However, if one fails to consider quintile position, policies 8 and 9 are particularly detrimental to white, college-educated males relative to nonwhite, non–college educated females.

6.5.7 Internal Rates of Return Under Alternative Policies

Table 6.11 considers how the ten policies alter internal rates of return. With the exception of the benefit cut and accelerated increase in NRA policies, the reforms produce rather small changes in overall internal rates of return for cohort 45. For cohort 95, however, the story is quite different. Six of the ten policies reduce the overall internal rate of return by 0.5 or more percentage points. Policy 6, which stabilizes real benefits, produces a negative 2.3 percent rate of return. This is to be expected, given that the policy cuts initial benefits based on a compound productivity growth factor.

Higher earners in all three cohorts experience the sharpest reductions in internal rates of return. In cohort 95, four of the ten policies reduce the internal rates of return of those in the top quintile by 0.9 percentage points or more. Policy 6 lowers the internal rate of return of those in the top quintile in cohort 95 from 0.6 percent to −3.8 percent! Of the ten policies, eight leave top quintile earners in cohort 95 with negative to very close to zero rates of return.

While all ten policies substantially lower rates of return earned by the lifetime high earners, only policy 6 dramatically reduces the rate of return earned by the lifetime poor, and only in the case of cohort 95. Take, as an example, the tax hike policy. For the bottom quintile in cohort 95, the internal rate of return declines from 5.7 percent to 4.8 percent. Although this may seem small, its also consistent with table 6.7's finding that the policy raises this group's lifetime net tax rate by 3.8 percentage points—not a small amount. The point that must be kept in mind, then, is the standard one about the power of compound interest; in this context, it means that small differences in internal rates of return can translate into very large differences in lifetime net tax rates.

As expected, policy 9 (eliminating the earnings ceiling without changing

Table 6.11 The Impact of Potential OASI Reforms on Internal Rates of Return, All Observations

	Lowest	Middle	Highest	All
Birth Cohort 1945–49				
0 Current rules	5.7	2.4	0.8	1.9
1 38% tax hike beginning in year 2000	5.7	2.3	0.5	1.7
2 25% benefit cut beginning in year 2000	5.0	1.6	−0.1	1.1
3 Accelerated increase in NRA	5.3	1.8	0	1.3
4 CPI indexing of covered earnings	5.5	2.2	0.6	1.7
5 Indexing benefits by CPI minus 1%	5.5	2.1	0.4	1.6
6 Stabilize real per capita benefits	5.4	2.1	0.4	1.6
7 Freeze bend points in real terms	5.7	2.3	0.7	1.8
8 Eliminate earnings ceiling	5.8	2.4	0.6	1.9
9 Eliminate earnings ceiling without benefit change	5.7	2.4	0.4	1.8
10 Increase computation years from 35 to 40	5.6	2.3	0.7	1.8
Birth Cohort 1970–74				
0 Current rules	5.8	2.8	0.6	1.8
1 38% tax hike beginning in year 2000	5.2	2.0	−0.2	1.1
2 25% benefit cut beginning in year 2000	5.0	1.9	−0.2	1.0
3 Accelerated increase in NRA	5.4	2.3	0.1	1.3
4 CPI indexing of covered earnings	5.5	2.5	0.4	1.6
5 Indexing benefits by CPI minus 1%	5.5	2.4	0.2	1.5
6 Stabilize real per capita benefits	4.5	1.4	−0.9	0.4
7 Freeze bend points in real terms	5.5	2.4	0.2	1.5
8 Eliminate earnings ceiling	5.9	2.8	0.2	1.5
9 Eliminate earnings ceiling without benefit change	5.8	2.8	−0.7	1.1
10 Increase computation years from 35 to 40	5.6	2.7	0.6	1.7
Birth cohort 1995–2000				
0 Current rules	5.7	2.8	0.6	1.9
1 38% tax hike beginning in year 2000	4.8	1.9	−0.4	0.9
2 25% benefit cut beginning in year 2000	4.9	2.0	−0.3	1.0
3 Accelerated increase in NRA	5.3	2.3	0.1	1.4
4 CPI indexing of covered earnings	5.4	2.6	0.4	1.7
5 Indexing benefits by CPI minus 1%	5.4	2.5	0.2	1.5
6 Stabilize real per capita benefits	2.0	−1.3	−3.8	−2.3
7 Freeze bend points in real terms	5.2	2.2	−0.1	1.2
8 Eliminate earnings ceiling	5.8	2.8	0.1	1.5
9 Eliminate earnings ceiling without benefit change	5.7	2.8	−0.8	1.1
10 Increase computation years from 35 to 40	5.5	2.7	0.5	1.8

Source: Author's calculations.

benefits) significantly reduces the internal rates of return for those in the highest quintile, especially for later-born cohorts. The patterns shown in table 6.11 are reproduced to varying degrees in web site tables 9 through 16, which break down the policy effects on internal rates of return by demographic subgroup. Policy 3 (the accelerated increase in NRA) affects older men more than older women, but the same is not true for younger men versus younger women. For example, the internal rate of return (not controlling for quintile) falls by 0.9 percentage points for men but only by 0.5 percentage points for women in cohort 45. In contrast, the corresponding changes are 0.6 percentage points for men and 0.5 percentage points for women in cohort 95. This result may arise because the longevity difference between men and women is greater for cohort 45 than for cohort 95. As a result, postponing the NRA affects men more than women in the older cohort, but this effect is not as pronounced for younger men versus women. Web site tables 9 through 16 reveal no other significant differences across demographic groups with respect to the manner in which internal rates of return respond to particular policy changes.

6.5.8 Implicit Wealth Tax Rates Under Alternative Policies

Table 6.12 shows how OASI implicit wealth taxes, calculated at a 5 percent discount rate, would be altered by the ten policies. Each policy would raise implicit tax rates for all postwar cohorts, but for the oldest cohorts the effects would be small. In the case of cohort 45, the current rules implicit tax rate is 66.3 percent. Policy 2 (the explicit benefit cut) produces the largest increase in this tax rate, but the increase is only to 74.8 percent. For cohort 95, the implicit tax rate under current law is 65.8 percent. Policy 6 generates the greatest increase in this tax rate, to 91.5 percent; policy 2 generates the second greatest increase, to 75.2 percent.

The increases in implicit wealth tax rates are more dramatic for the bottom quintile of cohort 95. This quintile faces a negative current rules tax rate equal to −28.9 percent, meaning the government is returning in benefits 1.289 cents per dollar paid in taxes. Policies 1, 2, and 6 reverse the sign of this group's implicit tax rate. Indeed, policy 6 raises the tax rate all the way to 67.1 percent. For the top quintile in cohort 95, six of the policies generate implicit wealth tax rates in excess of 80 percent; policy 6 imposes an implicit tax rate of 94.4 percent. Web site tables 17 through 24 provide demographic breakdowns of these results. As in the case of lifetime net tax rates and internal rates of return, the basic patterns of policy impacts experienced by the overall samples in each cohort carry over to the demographic subgroups.

Tables 6.13 and 6.14 consider how the implicit wealth tax rates would differ when calculated based on either a 3 percent or a 7 percent real discount rate. The answer is that they would differ enormously. Under current rules, the lowest quintile of cohort 70 faces a negative 175 percent

Table 6.12 **The Impact of Potential OASI Reforms on Implicit Wealth Tax Rates, All Observations (r = 5%)**

	Quintile of Average Benefits			
	Lowest	Middle	Highest	All
Birth cohort 1945–49				
1 Current rules	−35.3	61.5	75.6	66.3
2 38% tax hike beginning in year 2000	−31.6	62.7	76.7	67.6
3 25% benefit cut beginning in year 2000	−1.5	71.4	81.7	74.8
4 Accelerated increase in NRA	−14.1	69.4	81.6	73.6
5 CPI indexing of covered earnings	−24.8	64.6	77.1	68.8
6 Indexing benefits by CPI minus 1%	−20.9	65.3	77.9	69.6
7 Stabilize real per capita benefits	−19.4	66.1	78.5	70.3
8 Freeze bend points in real terms	−31.3	62.8	76.7	67.5
9 Eliminate earnings ceiling	−37.1	61.3	75.3	66.3
10 Eliminate earnings ceiling without benefit change	−35.3	61.5	77.1	67.3
11 Increase computation years from 35 to 40	−29.0	63.0	76.3	67.5
Birth cohort 1970–74				
1 Current rules	−33.7	55.6	78.2	67.5
2 38% tax hike beginning in year 2000	−8.8	64.8	82.8	74.3
3 25% benefit cut beginning in year 2000	−0.1	67.0	83.7	75.8
4 Accelerated increase in NRA	−16.0	63.1	82.2	73.1
5 CPI indexing of covered earnings	−21.6	59.4	79.6	70.2
6 Indexing benefits by CPI minus 1%	−18.9	60.1	80.4	70.9
7 Stabilize real per capita benefits	18.3	73.3	86.8	80.4
8 Freeze bend points in real terms	−21.9	60.9	81.2	71.6
9 Eliminate earnings ceiling	−39.8	55.1	79.7	70.1
10 Eliminate earnings ceiling without benefit change	−33.6	55.7	84.7	73.6
11 Increase computation years from 35 to 40	−25.9	57.3	78.6	68.7
Birth cohort 1995–2000				
1 Current rules	−28.9	53.8	77.5	65.8
2 38% tax hike beginning in year 2000	6.5	66.5	83.7	75.2
3 25% benefit cut beginning in year 2000	3.6	65.7	83.1	74.5
4 Accelerated increase in NRA	−12.5	60.8	81.1	71.1
5 CPI indexing of covered earnings	−16.6	57.7	78.9	68.6
6 Indexing benefits by CPI minus 1%	−15.2	58.1	79.7	69.2
7 Stabilize real per capita benefits	67.1	88.8	94.4	91.5
8 Freeze bend points in real terms	−8.8	62.6	82.4	72.9
9 Eliminate earnings ceiling	−32.7	53.6	79.9	69.5
10 Eliminate earnings ceiling without benefit change	−28.8	53.9	84.8	72.8
11 Increase computation years from 35 to 40	−21.5	55.6	77.9	67.0

Source: Author's calculations.

Table 6.13 **The Impact of Potential OASI Reforms on Implicit Wealth Tax Rates, All Observations (r = 7%)**

	Quintile of Average Benefits			
	Lowest	Middle	Highest	All
Birth cohort 1945–49				
1 Current rules	38.7	82.2	88.2	83.8
2 38% tax hike beginning in year 2000	40.1	82.6	88.5	84.2
3 25% benefit cut beginning in year 2000	53.8	86.8	91.2	87.9
4 Accelerated increase in NRA	49.2	86.0	91.1	87.4
5 CPI indexing of covered earnings	43.4	83.7	88.9	85.0
6 Indexing benefits by CPI minus 1%	44.5	83.8	89.2	85.2
7 Stabilize real per capita benefits	45.9	84.4	89.6	85.7
8 Freeze bend points in real terms	40.5	82.8	88.7	84.4
9 Eliminate earnings ceiling	38.0	82.2	87.8	83.6
10 Eliminate earnings ceiling without benefit change	38.7	82.2	88.7	84.1
11 Increase computation years from 35 to 40	41.7	82.9	88.5	84.4
Birth cohort 1970–74				
1 Current rules	33.5	78.6	89.4	84.2
2 38% tax hike beginning in year 2000	45.2	82.7	91.5	87.3
3 25% benefit cut beginning in year 2000	50.2	84.1	92.1	88.2
4 Accelerated increase in NRA	42.6	82.3	91.4	87.0
5 CPI indexing of covered earnings	39.3	80.4	90.1	85.5
6 Indexing benefits by CPI minus 1%	40.0	80.6	90.4	85.7
7 Stabilize real per capita benefits	59.4	87.2	93.6	90.5
8 Freeze bend points in real terms	39.3	81.2	90.9	86.2
9 Eliminate earnings ceiling	30.7	78.3	89.8	85.2
10 Eliminate earnings ceiling without benefit change	33.5	78.7	92.3	86.9
11 Increase computation years from 35 to 40	37.7	79.4	89.7	84.8
Birth cohort 1995–2000				
1 Current rules	36.4	77.1	89.0	83.2
2 38% tax hike beginning in year 2000	53.9	83.4	92.0	87.8
3 25% benefit cut beginning in year 2000	52.4	83.1	91.8	87.5
4 Accelerated increase in NRA	44.7	80.6	90.8	85.8
5 CPI indexing of covered earnings	42.3	79.1	89.7	84.6
6 Indexing benefits by CPI minus 1%	42.5	79.1	90.0	84.7
7 Stabilize real per capita benefits	83.8	94.5	97.3	95.9
8 Freeze bend points in real terms	46.3	81.5	91.4	86.7
9 Eliminate earnings ceiling	34.5	77.0	89.9	84.8
10 Eliminate earnings ceiling without benefit change	36.4	77.2	92.4	86.4
11 Increase computation years from 35 to 40	40.2	78.1	89.2	83.8

Source: Author's calculations.

Table 6.14 The Impact of Potential OASI Reforms on Implicit Wealth Tax Rates, All Observations (r = 3%)

	Quintile of Average Benefits			
	Lowest	Middle	Highest	All
Birth cohort 1945–49				
1 Current rules	−196.1	19.2	50.9	30.9
2 38% tax hike beginning in year 2000	−185.0	22.9	54.2	34.9
3 25% benefit cut beginning in year 2000	−121.8	39.9	63.3	48.4
4 Accelerated increase in NRA	−152.3	35.3	62.8	45.6
5 CPI indexing of covered earnings	−173.0	25.7	53.8	36.1
6 Indexing benefits by CPI minus 1%	−160.6	28.0	56.1	38.4
7 Stabilize real per capita benefits	−161.2	28.8	56.7	39.1
8 Freeze bend points in real terms	−187.3	21.9	53.1	33.4
9 Eliminate earnings ceiling	−200.2	18.9	51.9	32.0
10 Eliminate earnings ceiling without benefit change	−196.1	19.3	55.5	34.1
11 Increase computation years from 35 to 40	−182.6	22.3	52.3	33.5
Birth cohort 1970–74				
1 Current rules	−175.0	8.9	55.6	33.7
2 38% tax hike beginning in year 2000	−122.1	29.1	65.7	48.6
3 25% benefit cut beginning in year 2000	−105.9	32.1	66.8	50.5
4 Accelerated increase in NRA	−140.8	23.8	63.5	44.7
5 CPI indexing of covered earnings	−149.4	16.5	58.4	39.1
6 Indexing benefits by CPI minus 1%	−140.5	19.1	60.6	41.2
7 Stabilize real per capita benefits	−68.2	45.1	73.1	59.8
8 Freeze bend points in real terms	−150.8	19.6	61.7	42.0
9 Eliminate earnings ceiling	−189.6	7.9	60.1	40.3
10 Eliminate earnings ceiling without benefit change	−175.0	9.0	70.0	47.3
11 Increase computation years from 35 to 40	−159.4	12.3	56.5	36.0
Birth cohort 1995–2000				
1 Current rules	−170.9	7.5	54.7	31.4
2 38% tax hike beginning in year 2000	−96.4	32.9	67.2	50.2
3 25% benefit cut beginning in year 2000	−102.8	31.1	66.1	48.8
4 Accelerated increase in NRA	−137.6	21.1	62.1	41.9
5 CPI indexing of covered earnings	−145.2	15.1	57.5	36.9
6 Indexing benefits by CPI minus 1%	−138.8	17.0	59.6	38.7
7 Stabilize real per capita benefits	30.5	77.4	88.7	83.0
8 Freeze bend points in real terms	−128.8	24.9	64.6	45.6
9 Eliminate earnings ceiling	−179.5	6.8	60.5	39.7
10 Eliminate earnings ceiling without benefit change	−170.7	7.8	70.1	46.3
11 Increase computation years from 35 to 40	−155.9	11.1	55.6	33.7

Source: Author's calculations.

implicit tax rate when the discount rate is 3 percent, and a 33.5 percent implicit tax rate when the discount rate is 7 percent. For middle quintile members of cohort 70, seventy-seven cents of every dollar contributed to OASI is a tax if one accepts a 7 percent discount rate; only nine cents of every dollar is a tax if one does the calculation with a 3 percent discount rate.

6.5.9 Benefit Reductions of Retirees by Quintiles of Average Social Security Benefits

Our final set of tables, table 6.15 and web site tables 25 through 32, shows how the various policies alter the average OASI benefits received by a subset of observations in cohorts 45, 70, and 90—namely, those who receive benefits for at least one year after reaching age sixty-two. In these tables, rather than classify observations within the three cohorts on the basis of lifetime earnings quintiles, we sort the observations based on quintiles of average OASI benefits received after reaching age sixty-two. Before sorting the observations, we calculate for each observation the average amount of benefits received (in 1998 dollars) over only the years in which the observation is age sixty-two or older and actually receives benefits. Since roughly 40 percent of retired American households appear to be living almost exclusively from Social Security benefits, the lowest quintile of Social Security benefit recipients represents individuals for whom Social Security income is critically important.

Under current rules, average benefits are generally higher in constant 1998 dollars for later retiring cohorts—reflecting the projected growth in benefits due to real wage growth. This statement is not true for those in the lowest quintile of average benefits, presumably because this cohort (and others close to it) will bear the brunt of the increase in the NRA already scheduled to occur during the first two decades of the next century.

Among the ten policies considered here, policies 1 and 9 do not affect OASI benefits at all. Policy 2 generates precisely what it is supposed to: a 25 percent benefit cut across all cohorts and quintiles. Policy 3 (the accelerated increase in NRA) reduces benefits by less than policy 2 across all cohorts and quintiles. It hurts earlier born generations by more because, given the increase in NRA already scheduled under current rules, policy 3 exposes these cohorts to a larger increase in NRA compared to later born generations. Although in dollar terms policy 3 hurts those in the highest quintiles the most, it reduces the benefits of the benefit-poor by more in percentage terms. For cohort 95, for example, it reduces the average benefit by $921 at the lowest quintile, a 19 percent reduction, and by $3,338 at the highest quintile of average benefits, a 12 percent reduction.

Policy 4 (CPI indexing of Covered Earnings) exhibits a similar pattern across quintiles to that of policy 2. In percentage terms, it harms the benefit-poor by more than the benefit-rich. In this case, however, the reason is that a marginal reduction in the AIME of better-off individuals does

Table 6.15 The Impact of Potential OASI Reforms on Average Benefits, All Observations

	Quintile of Average Benefits			
	Lowest	Middle	Highest	All
Birth cohort 1945–49				
1 Current rules	3,814	8,612	17,203	9,614
2 38% tax hike beginning in year 2000	3,814	8,612	17,203	9,614
3 25% benefit cut beginning in year 2000	2,863	6,518	12,968	7,267
4 Accelerated increase in NRA	2,871	6,881	13,695	7,620
5 CPI indexing of covered earnings	3,450	7,883	16,243	8,931
6 Indexing benefits by CPI minus 1%	3,438	7,680	15,401	8,589
7 Stabilize real per capita benefits	3,374	7,644	15,241	8,532
8 Freeze bend points in real terms	3,695	8,364	16,494	9,271
9 Eliminate earnings ceiling	3,814	8,651	18,735	9,949
10 Eliminate earnings ceiling without benefit change	3,814	8,612	17,203	9,614
11 Increase computation years from 35 to 40	3,599	8,279	16,742	9,274
Birth cohort 1970–74				
1 Current rules	3,757	9,313	20,305	10,757
2 38% tax hike beginning in year 2000	3,757	9,313	20,305	10,757
3 25% benefit cut beginning in year 2000	2,830	7,054	15,264	8,108
4 Accelerated increase in NRA	3,048	7,781	17,203	9,008
5 CPI indexing of covered earnings	3,284	8,505	19,112	9,928
6 Indexing benefits by CPI minus 1%	3,363	8,239	18,013	9,537
7 Stabilize real per capita benefits	2,287	5,760	12,415	6,601
8 Freeze bend points in real terms	3,410	8,354	17,602	9,445
9 Eliminate earnings ceiling	3,757	9,410	27,425	12,254
10 Eliminate earnings ceiling without benefit change	3,757	9,313	20,305	10,757
11 Increase computation years from 35 to 40	3,511	8,949	19,973	10,421
Birth cohort 1995–2000				
1 Current rules	4,919	12,212	26,868	14,143
2 38% tax hike beginning in year 2000	4,919	12,212	26,868	14,143
3 25% benefit cut beginning in year 2000	3,688	9,258	20,188	10,643
4 Accelerated increase in NRA	3,998	10,336	23,530	12,040
5 CPI indexing of covered earnings	4,317	11,172	25,204	13,049
6 Indexing benefits by CPI minus 1%	4,401	10,847	24,034	12,610
7 Stabilize real per capita benefits	1,216	3,143	6,903	3,606
8 Freeze bend points in real terms	4,078	10,108	21,246	11,275
9 Eliminate earnings ceiling	4,921	12,355	35,777	16,028
10 Eliminate earnings ceiling without benefit change	4,919	12,212	26,868	14,143
11 Increase computation years from 35 to 40	4,602	11,742	26,378	13,696

Source: Author's calculations.

not translate into a proportional reduction in their benefits because they face lower marginal PIA rates. Policy 5 (Indexing benefits by CPI minus 1 percent) yields the most uniform percentage reduction in average benefits across all cohorts and quintiles—about 11 percent. At 75 percent, policy 6 (Stabilizing Real Per Capita Benefits) generates very large benefit reduction for cohort 95. The reduction is a sizable 40 percent for cohort 70 and is only 11 percent for the oldest cohort. The percentage reductions for the respective cohorts are uniform across quintiles.

As expected, policy 7 generates a larger percentage benefit reduction for the youngest cohort—about 20 percent overall. As mentioned earlier, this occurs because the bracket-creep effect is most severe for later born generations. Policy 8 leads to an *increase* in future benefits for the middle and highest quintiles of all cohorts, but this effect is strongest in percentage terms for members of the highest quintile of cohort 70. Their average annual benefit (conditional on receiving a benefit) increases by more than $7,000—an increase of 35 percent over that under current rules. Finally, policy 10 (Increasing Computation Years from 35 to 40) leads to fairly modest reductions in average benefits across all cohorts and quintiles. Tables 36 through 43 (located on the web site) report reductions in average benefits by demographic group; the benefits reductions in these tables are similar to those in table 35.

6.6 Summary and Conclusion

This paper uses CORSIM, a dynamic microsimulation model developed by Steven Caldwell and his colleagues, and Economic Security Planner's detailed Social Security benefit calculator to study how potential reform of Social Security's OASI program would affect postwar Americans. We consider ten alternative reforms, including a major and immediate increase in the OASI tax rate, a major and immediate cut in benefits, an accelerated increase in the age of normal retirement, two alternative methods of moving from wage-indexed to price-index benefits, and the elimination of the ceiling on taxable payroll. We present results for different postwar cohorts and different lifetime earnings groups within those cohorts and decompose these results by sex, race, and education. We also demonstrate the sensitivity of certain of our results to the choice of real discount rate.

Our measures of the impacts of reform are four: how the reforms alter OASI lifetime net tax rates, internal rates of return, implicit wealth tax rates, and average benefit levels received by retirees. Regardless of which measure we examine, the message of our paper is clear: Reforms to the OASI system of the type needed to bring the system's finances into present value balance are likely to greatly worsen OASI's treatment of postwar Americans. Although sex, race, and education play a role in determining current and prospective OASI treatment of postwar Americans, the primary determinant of this treatment is an individual's cohort and position in the distribution of lifetime earnings.

The youngest postwar generations have the most to worry about in this regard because tax increases will affect them over their entire working careers and benefit cuts will be fully phased in when they retire. Under current law, today's newborns are slated to surrender five cents of every dollar earned to the OASI system in taxes paid net of benefits received. That lifetime net tax rate could rise as high as 8 percent under some of the reforms being contemplated by Social Security's actuaries. For the poorest members of today's newborn generation, a number of the reforms would transform the system from a net subsidy to a net tax. For the highest-earning members of today's newborn generations, some of the reforms translate into large negative internal rates of return on contributions and implicit wealth taxes of close to 100 percent.

To conclude, this paper assumes the OASI system will continue to run on a PAYGO basis and considers alternative reforms to achieve financial solvency. Each is highly unpleasant. However, some reforms are more even-handed than are others with respect to their distribution of additional fiscal burdens both across and within generations. Microsimulation analysis of the kind presented here can help policy makers better sugarcoat what will inevitably be a bitter pill.

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Comment David A. Wise

Jagadeesh Gokhale and Laurence Kotlikoff have written a very informative paper. I like it. The results of their analysis are very sobering, and perhaps even suggest, as the authors put it, "how bad Social Security's treatment of postwar Americans would be under alternative tax increases and benefit cuts." The most striking conclusion is that balancing the Social Security budget would require a 4 percentage point, or 38 percent, increase in the OASI current 10.6 percent tax rate. The very high tax rates and low internal rates of return posited for most participants, while perhaps not new ideas, are also depressing. Finally, the differential effect of potential reforms on different lifetime income groups should inform future discussion of reform proposals.

The analysis is based on "synthetic" data, which at first aroused my suspicions, but the benchmark evidence that the authors present has left me more comfortable with these data. The results are likely to be very sensitive to some key assumptions, however, and I would like to emphasize a few of these. Perhaps the most important is the assumed discount rate. In addition, to compare the results with those of the Social Security Trust Fund actuaries, a few additional simulations would be informative, and I will mention those as well.

Data and Benchmarks

The analysis is based on key inputs from Caldwell et al. (1999), the CORSIM synthetic data, and the Social Security Benefit Calculator

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(SSBC). The authors produced their data by running the CORSIM model from the year 1960 to 2100 and selecting a master sample of particular groups born between 1945 and 2000. This sample is separated into three lifetime earnings quintiles—lowest, middle, and highest (discounting at 5 percent from age eighteen to the end of life). The CORSIM data begin with a sample from the 1960 U.S. Census. The census data are supplemented with data from many other sources, including the data from the High School and Beyond Survey, National Longitudinal Survey, the Panel Study of Income Dynamics, the Survey of Consumer Finances, and others. CORSIM "grows" the sample demographically and economically to 2100, based on a large number of equations and rule-based algorithms. The process seems very complicated. My inclination is to be very suspicious of such data files, but I was for the most part reassured by the benchmarking described by the authors.

For example, the longevity of the synthetic data groups seems to correspond rather well to "actual" data. The average longevity is 79.5 for the five oldest cohorts and 81.1 for the five youngest. The most recent Decennial Life Tables, by comparison, show "cross-sectional" life expectancy of 75.4 years. In Gokhale and Kotlikoff's calculations, the life expectancy of women is 6.3 years longer than that of men. The life tables show a difference of 6.7 years. According to Gokhale and Kotlikoff, however, whites live only about two years longer than nonwhites, which is much less than the life tables' difference of 4.9 years. The paper does correctly present a substantial correlation between earnings and life expectancy. For example, men in the highest quintile in the 1985 cohort live 7.1 years longer than men in the lowest quintile. The paper's account of differences by education is also persuasive. With respect to income, those in the highest quintile earn over their lifetimes thirty-three to thirty-nine times as much as those in the lowest quintile. This compares rather well with the lowest versus the highest decile of lifetime earnings reported in Venti and Wise (2001), based on the Social Security earnings histories of HRS respondents. We found that the top decile earned about forty-six times as much as the bottom decile, with no correction for the top coding at the Social Security covered earnings limit.

The SSBC ignores the disability insurance part of Social Security and leaves out federal and state taxes of SS benefits. This calculator is extremely detailed and seems to have been subjected to much checking.

Summary of Results

Because Gokhale and Kotlikoff's results are presented in such a quantity of lengthy tables, I have tried to summarize the key results here. The first results reported in the paper (tables 6.4–6.6) are reproduced from Caldwell et al. and are summarized in the next two figures, which show lifetime tax rates, internal rates of return, and wealth taxes by quintile for

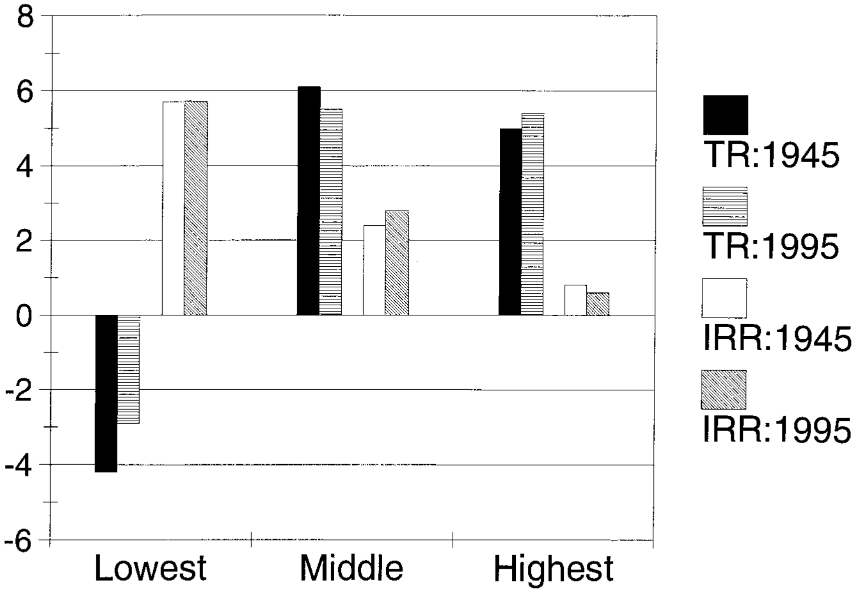

Fig. 6C.1 Tax Rates and Internal Rates of Return

the 1945 and 1995 cohorts. The lifetime tax rate is given by (PVT − PVB)/PVE, where PVT is the present value of lifetime taxes, PVB is the present value of benefits, and PVE is the present value of lifetime earnings. The wealth tax is given by 1 − PVB/PVT. Both the wealth tax and the tax rate are calculated based on a real discount rate of 5 percent (to which I will return below). The internal rate of return is determined by choosing the discount rate such that PVB = PVT. These results show low tax rates and rather high internal rates of return for the lowest quintile and high tax rates and low internal rates of return for the middle and especially the highest quintiles.

The analysis new to this paper examines the distributional effects of potential Social Security reforms. For example, many reforms would have a disproportionate effect on the lowest income quintile. This is shown with respect to the tax rate for the 1945 cohort in the next figure. The figure shows changes from the tax rates under the current rules. (The labels are shorter versions of the labels on the authors' tables beginning with table 6.8.) The following figure shows the effect on tax rates for the 1995 cohort.

Time Horizon and Life Expectancy

These results, like those based on any projections, are subject to many assumptions and conventions. I would like to mention three in particular which are likely to have an important effect on the conclusions. First, the

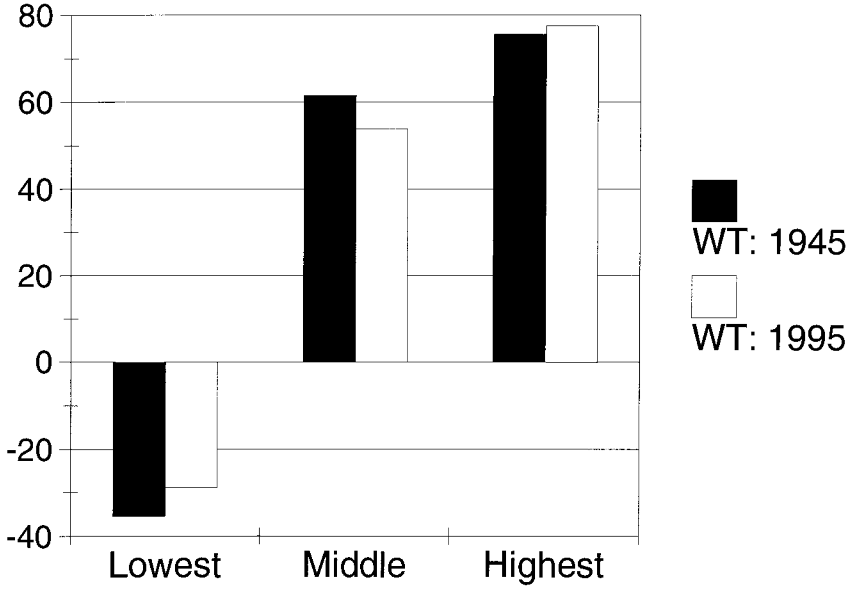

Fig. 6C.2 Wealth Taxes

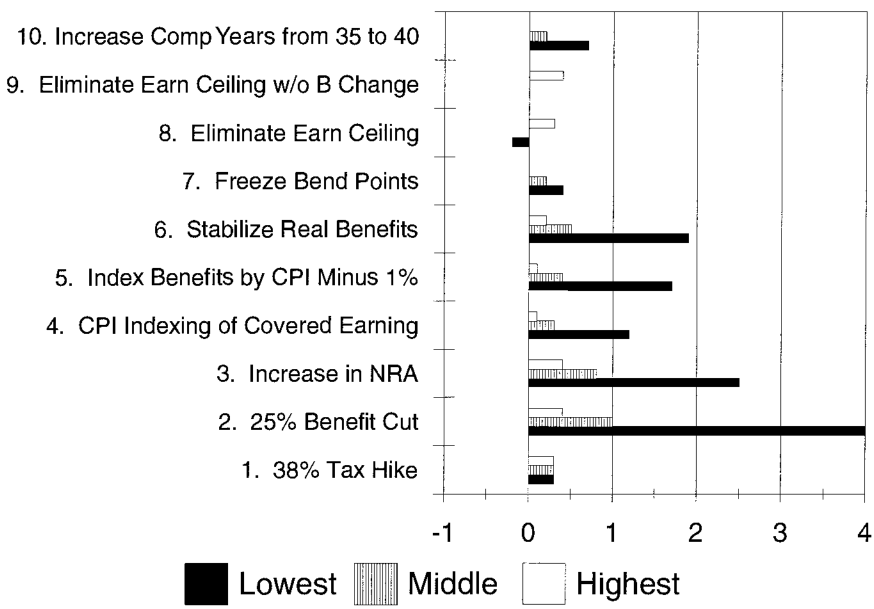

Fig. 6C.3 Tax Rate Change by Quintile: C1945

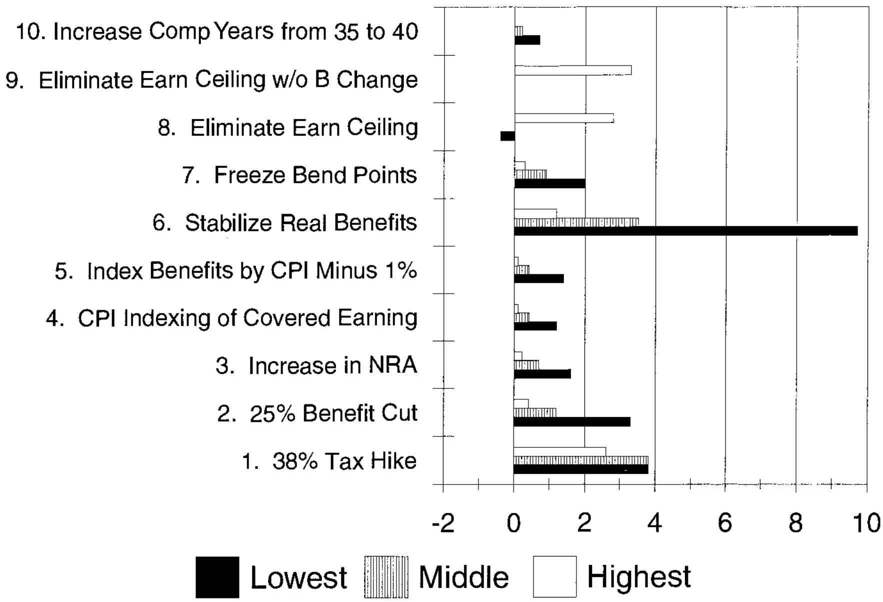

Fig. 6C.4 Tax Rate Change by Quintile: C1995

authors conclude that to balance the Social Security budget would require an immediate 4 percentage point, or 38 percent, increase in the OASI current 10.6 percent tax rate. This is more than twice the rate projected by the Social Security Trust Fund actuaries. The authors' explanation is that the Social Security actuaries use a seventy-five-year projection horizon, while their results are based on projections through the year 2100. I believe it would strengthen the results reported in the paper if the authors also reported results that correspond to the seventy-five-year horizon used by the actuaries, confirming that these data yield the trustees' results when their convention is used.

Second, longevity assumptions built into the CORSIM data seem to correspond closely to (and perhaps reflect) the Social Security intermediate demographic assumptions. Many prominent demographers believe, however, that actual future realized life spans will be much greater than the longevity assumptions used here, and the authors emphasize this fact. Indeed, one demographer has told me that he would not be surprised if the average girl baby born today lived 100 years. Whatever the truth, death rates are likely to see declines much greater than those assumed in these data, which yield the results reported here. More rapid, and I would say more realistic, declines would suggest a much larger Social Security liability under the current program provisions and much larger benefits, than the results the authors report.

Discount Rate

Finally, the discount rate assumptions can have a very large effect on the results. The authors use a 5 percent discount rate to make individual money's worth calculations, arguing that this rate is justified because future Social Security benefits are risky. They are indeed risky. Many events could result in benefits much less than promised benefits. Demographic changes are a key uncertainty, as emphasized above. "Errors," like the one that led to double indexing in the 1970s, are another. The political process could change the plan provisions substantially. Nonetheless, the "right" rate could be higher or lower than authors assume. Thus, it would be informative to see some calculations showing how much the discount rate matters. Here let me simply demonstrate that I believe it would matter a great deal.

The authors assume a 5 percent real discount rate for the individual money's worth calculations. The Social Security actuaries use 3 percent (the rate that Gokhale and Kotlikoff use to assess the effect of reforms on the present value of the Social Security budget). Because the calculated tax rates and wealth taxes are very sensitive to the assumed discount rate, perhaps Gokhale and Kotlikoff could present some sensitivity analysis to demonstrate the degree to which this rate matters. The potential sensitivity to the discount rate can perhaps be demonstrated by observing the relationship between the internal rate of return, a data-determined calculation, and the wealth tax and the tax rate, which are based on an assumed 5 percent discount rate. Recall that the relationship between the discount rate and the ratio of the present value of benefits to the present value of taxes looks like the line marked by squares in the figure below. The internal rate of return is determined by finding the discount rate such that PVB = PVT, so that the ratio is one. Thus, when the discount rate is equal to the internal rate of return, both the wealth tax [1 − PVB/PVT] and the tax rate [(PVT − PVB)/PVE] are equal to zero. For example, if the internal rate of return is 5 percent and the discount rate is 5 percent, both will be zero. Then, for discount rates below 5 percent, PVB > PVT, and both the wealth tax and the tax rate will be negative. For discount rates greater than 5 percent, PVB < PVT, and both the wealth tax and the tax rate will be positive.

For example, consider the internal rate of return and the wealth tax for all nonwhite persons in the lowest quintile in the 1990 cohort. The internal rate of return is 5.0 percent, and because the assumed discount rate is also 5.0 percent, both the wealth tax (I presume except for rounding error) and the tax rate are zero. However, for the 1985 cohort in the same quintile, the internal rate of return is 5.7 percent, the discount rate is less than the internal rate of return, and the wealth tax and tax rate are negative. For persons in the middle quintile in the 1985 cohort, the internal rate of return is only 2.6 percent, so the assumed discount rate is much larger than the internal rate of return, and the wealth tax and tax rate are very large.

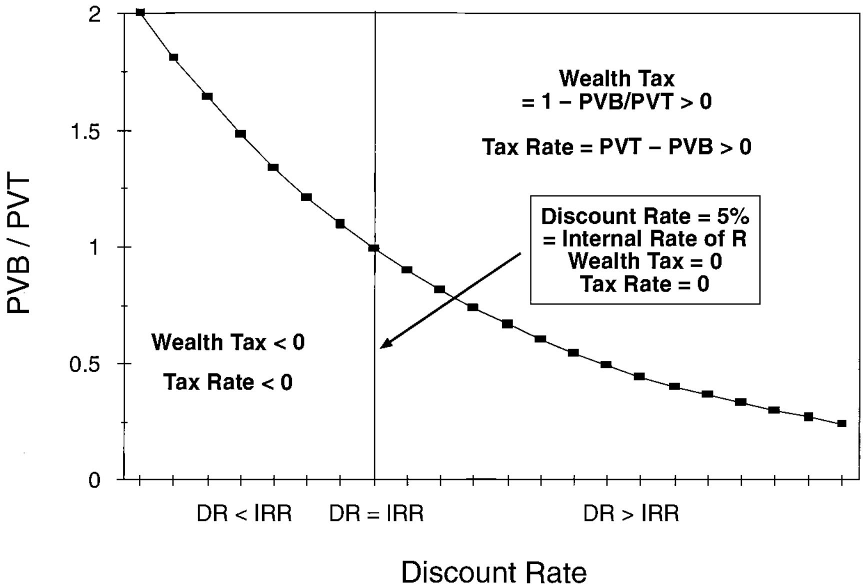

Fig. 6C.5 Discount Rate, Tax Rate, and Wealth Tax

The point of the example is to emphasize the sensitivity of the calculated wealth taxes and tax rates to the assumed discount rate. Both would be much lower if the assumed discount rate were lower and much higher if the assumed discount rate were higher.

As another example, consider the internal rate of return and the wealth tax of all women. The internal rate of return for the middle quintile in the 1945 cohort is 3.0, and the wealth tax is large—53.2 percent. If the assumed discount rate were 3 percent instead of 5 percent, the wealth tax for this group would be zero. The wealth tax for all other cohorts in the middle quintile would be negative. The wealth taxes for the lowest quintile would be more negative than they are. The wealth taxes of the highest quintile would still be positive, but much lower than the Gokhale and Kotlikoff estimates. On the other hand, if the discount rate were 7 percent, all of the wealth taxes would be greater than zero, even for the lowest quintile—except for the 1950 cohort, for which the wealth tax would be zero.

As emphasized above, there is no "correct" discount rate, and I have no reason to believe the one chosen by Gokhale and Kotlikoff is either too high or too low, but I believe some sensitivity analysis would demonstrate the substantial relationship between the assumed discount rate and the implied wealth taxes and tax rates.

In short, the results of this paper are striking and sobering. They ought to be used to help inform the current financial status of the Social Security

Table 6C.1

	Quintile		
Cohort	Lowest	Middle	Highest
	Internal Rate of Return		
1985	5.7	2.6	1.0
1990	5.0	2.6	0.8
	Wealth Tax		
1985	−28.5	58.4	75.7
1990	−0.5	57.3	76.8
	Tax Rate		
1985	−2.9	6.0	5.3
1990	0.0	5.8	5.3

Note: All nonwhite data.

Table 6C.2

	Internal Rate of Return, by Quintile			Wealth Tax, by Quintile		
	Lowest	Middle	Highest	Lowest	Middle	Highest
1945	5.9	3.0	1.7	−43.1	53.2	67.8
1950	7.0	3.2	1.6	−115.7	48.0	70.0
1955	6.5	3.1	1.3	−78.7	49.7	72.8
1960	6.4	3.2	1.2	−69.8	50.6	74.5
1965	6.3	3.2	1.3	−62.5	50.0	74.3
1970	6.3	3.2	1.2	−61.3	49.4	75.2
1975	6.3	3.2	1.4	−63.8	49.9	73.1
1980	6.5	3.3	1.3	−75.8	47.3	74.4
1985	6.3	3.3	1.4	−63.6	48.4	73.2
1990	6.1	3.3	1.3	−54.0	47.2	74.0
1995	6.0	3.2	0.9	−44.7	48.9	76.3

system, the gains or losses that current participants are receiving from the system, and the distributional effects of potential reforms of the current system.

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Discussion Summary

Gary Burtless described two reasons for the low rates of return for postwar generations. First, there was a large gift to the early generations of contributors that later generations are paying for with their payroll taxes. Second, the investment portfolio for the Social Security Trust Fund is extremely conservative and earns a much lower expected rate of return than the benchmark rate of return used to calculate the discount rate used in this paper. Even if we ignore the gift given to past generations, Social Security would still appear to be a bad deal for current contributors under the calculations in this paper. Burtless added that applying a discount factor of 5 percent would show that almost all insurance would have astoundingly high load factors. The authors defended their 5 percent discount rate, noting that the average internal rate of return for postwar Americans is 1.9 percent, while inflation-indexed government bonds have a return of more than 4 percent. Even if Social Security benefits are considered to be riskless assets (which they are not), it is clear that people are not receiving a good deal.

Burtless also believed that the calculation of tax burdens that people pay under the system is based on the assumption that all of the taxes that support these payments are indeed paid for by the worker. To the extent that labor does respond to taxation, employers will bear some of the tax burden, and, therefore, all of the tax contributions should not be added to the ledger as in this paper.

Charles Blahous emphasized the difference between the tax burden from Social Security taxes and the total tax burden. Around the year 2015 the federal government will have to use general revenue to pay the Social Security Trust Fund, and by 2030 the burden on general revenue will be approximately 5 percent of payroll. Clearly, the total tax burden will be much higher for workers entering the labor force in 2015. Consequently, the internal rate of return for the Social Security system depends on both the Social Security taxes and the general revenue requirements.

Martin Feldstein pointed out that the magnitude of the tax burden on future generations would be even higher if deadweight losses were considered.